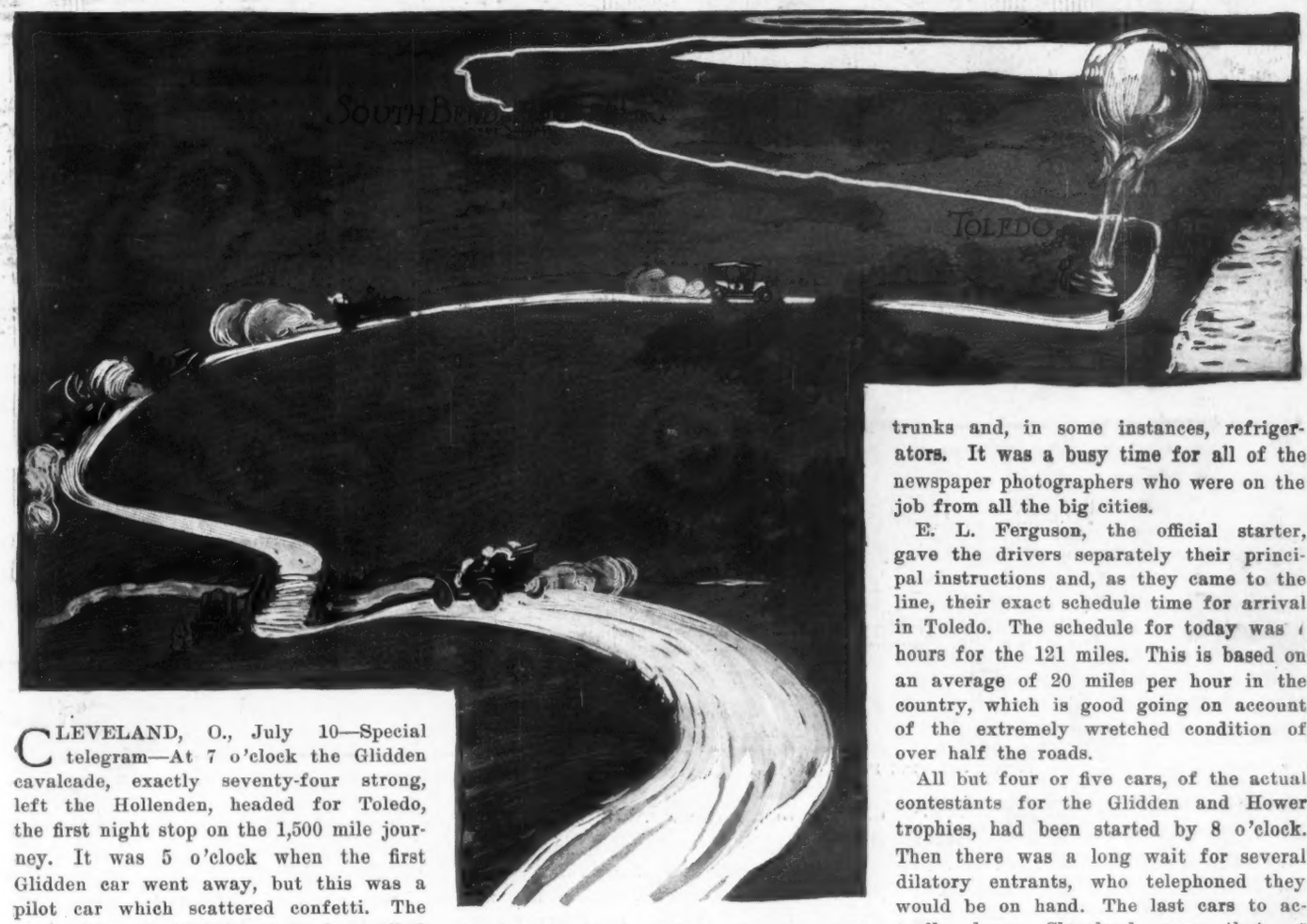
VOL. XII NO. 2 CHICAGO, JULY 11, 1907 PER YEAR $2

MOTOR AGE

GLIDDEN TOUR HAS AUSPICIOUS START



CLEVELAND, O., July 10—Special telegram—At 7 o'clock the Glidden cavalcade, exactly seventy-four strong, left the Hollenden, headed for Toledo, the first night stop on the 1,500 mile journey. It was 5 o'clock when the first Glidden car went away, but this was a pilot car which scattered confetti. The competition itself did not begin until 2 hours later when N. H. Van Sicklen, in the Apperson car which has been No. 1 for two successive seasons, checked out. After that the cars followed regularly at 1-minute intervals.

It was hardly daybreak when the activity of the start commenced in front of the hotel, it having been announced that the order of start would be by the order of position in the starting line. Numerous aspirants for first honors in getting away arose shortly after the night owls had retired in the hope of being the first on hand. From 3 o'clock on the sputtering of motors and the blowing of horns made a continuous alarm, which awakened the sleepers and brought the tardier ones onto the scene. At 5 o'clock the line had stretched to over a score of cars and by 6 practically all the starters were on hand.

The street was congested with cars running up and down the line, a quickly gathered crowd of Clevelanders, who packed the sidewalks to witness the novel event, and participants running hither and thither on the street. Some of those who had not completed every detail of preparation the night before fussed furiously over their cars; along the line baggage of all descriptions was strapped in place; tonneaus were piled high with suit cases; brass rails were padded with dusters and rubber coats, and runabouts were loaded heavily behind with hampers, touring trunks and, in some instances, refrigerators. It was a busy time for all of the newspaper photographers who were on the job from all the big cities.

E. L. Ferguson, the official starter, gave the drivers separately their principal instructions and, as they came to the line, their exact schedule time for arrival in Toledo. The schedule for today was 4 hours for the 121 miles. This is based on an average of 20 miles per hour in the country, which is good going on account of the extremely wretched condition of over half the roads.

All but four or five cars, of the actual contestants for the Glidden and Hower trophies, had been started by 8 o'clock. Then there was a long wait for several dilatory entrants, who telephoned they would be on hand. The last cars to actually leave Cleveland were that of Chairman Hower and the Motor Age Packard Thirty press car. The latter left at 8:37.

A careful checking at the starting point showed 245 passengers, exclusive of those in the pilot cars. Of this number fifteen are women, located as follows: Car No. 1, Mrs. N. H. Van Sicklen and Mrs. C. F. Van Sicklen; No. 2, Mrs. K. K. Otis and Miss Rollins; No. 7, Mrs. A. R. Welch; No. 14, Mrs. P. S. Flinn and Mrs. George H. Elbertson; No. 16, Mrs. O. A. Parker; No. 26, Mrs. Andrew Cuneo and Mrs. M. Cuneo; No. 36, Mrs. E. B. Finch and Mrs. W. A. Pungs; No. 92, Mrs. F. J. Fanning; No. 59, Mrs. R. B. Johnson; No. 52, Miss Houck.

FIRST DAY'S JOURNEY ONE OF EXTREME EASE

By E. RALPH ESTEP
Special Tour Correspondent

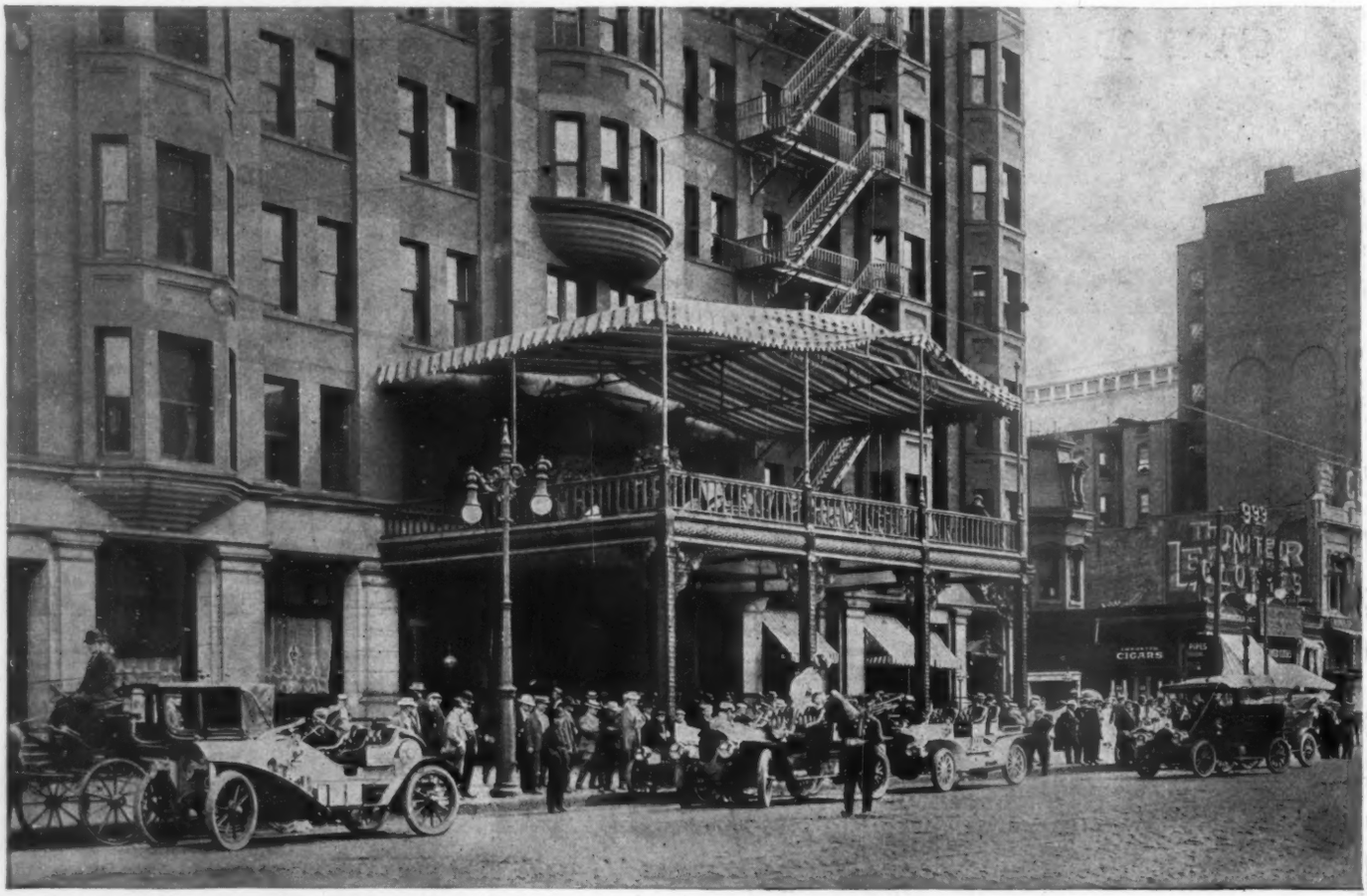
TOLEDO, O., July 10—Special telegram—Forty-five cars, contending for the Glidden trophy in teams representing eight different clubs; twelve runabouts, after the Hower trophy, and the non-contesting cars, such as those carrying the press and officials, made an easy run today over the extremely rough and very sandy road between Cleveland and Toledo. All but one of the Glidden cars reached the checking-out point on schedule time.

It was an auspicious beginning of the 2 weeks' tour, and a bright sky counteracted in part the discouraging influence of the bad roads. They do know how to build roads in western Ohio, and when they do build them they do not take care of them. The good fortune of the tourist in getting over this unseemly stretch of highway was due mainly to consistent driving and a general refrain from racing. The Motor Age press car, Packard Thirty, started last and an excellent opportunity was afforded to see the whole of the day's run as it was and as it cannot be known by those who start out at the head of the column. There were occasional speed battles, but these were of short duration, and generally fought out on double roads. All drivers showed great courtesy in passing vehicles, offering assistance to those who fell by the wayside and in allowing other cars going at a faster pace to get by.

Once out of Cleveland the road dipped to the beautiful lake shore drive and tantalized the whole procession to swing into its top notch speed, despite the sanctity of Cleveland ordinances. The boulevard had hardly ended, however, before the long ago worn out road began. Here, for miles and miles, the highway seemed a disgrace to the country. On either hand Ohio rolled in undulating hills and wide valleys, whose summer foliage had the freshness of spring. There are no great hills hereabout, but the country has none of the uninteresting flatness of the central west. This is a gentle land, well cultivated and seemingly prosperous in its peaceful pursuits. Its people are progressive and, in defiance of the roads they have to travel, many of its rural inhabitants own motor cars. This was attested by the frequent sight of home-grown cars lying in wait along the road to greet the tourists as they passed. Nor were the Ohio motorists the only ones to show interest in the widely heralded tour. Each village street was lined with spectators, all cheering the strangers. On lawn after lawn, porch after porch, farm fence after fence, were clustered smiling maidens and interested older folk.

Our own experience in No. 90, piloted by that star of cross-country drivers, Tom Fetch, was a glorious one because of the fact that having started last we were in a position to run up the line and see exactly how the contesting tourists had fared. There was little tire trouble and but few serious accidents, although the incessant hammering of the steadily moving cars on the rough road developed minor complaints. The most serious thing we passed was a bent front axle. This was caused by catching a front wheel on the side of a bridge while the car was being driven in the trail of dust of the one ahead.

The last dozen miles into Toledo were fairly smooth, but the somewhat worn macadam was heavy with dust. On this stretch most of the cars were ahead of their schedule and ran leisurely into town. It was a case of follow the leader far enough apart to keep out of the way of dust clouds. When we pulled up at the Boody house about two dozen of the earlier starters had arrived.



HOLLENDEN HOUSE, CLEVELAND, THE STARTING POINT OF THE GLIDDEN TOUR AND ALSO HEADQUARTERS OF THE CLEVELAND AUTOMOBILE CLUB

SCHEDULE OF DISTANCES FIRST DAY

Cleveland	0.	Berlinville	48.2
Rocky River	8.	Norwalk	55.2
Finney's Corners	9.8	Monroeville	60.
Dover	14.2	Bellevue	69.8
Bement	17.6	Clyde	77.4
Ridgeville	21.3	Fremont	85.
Elyria	26.	Woodville	99.6
Amherst	33.4	Lemoyne	106.1
Henrietta	36.7	Stony Ridge	108.1
Birmingham	39.4	Toledo	12.1

Cleveland to Elyria, good gravel road; Elyria to Birmingham, clay road; Birmingham to Norwalk, gravel and clay; Norwalk to Toledo, sand, gravel, macadam.

STATISTICAL STORY OF THE GLIDDEN

1907—Entries, 82; 47 Glidden; 14 Hower; 16 non-contestants; starters, 74.

1906—Entries, 74; starters, 55; 8 non-contestants; finishers, 30; perfect scores, 13, as follows: Arthur Holden, Stearns; G. M. Davis, Thomas; George Soules, Pope-Toledo; W. C. Walker, Pope-Hartford; P. S. Flinn, Pierce Arrow; W. E. Wright, Knox; C. F. Barrett, Columbia; P. P. Pierce, Pierce Arrow; A. E. Hughes, Pierce; E. Keeler, Oldsmobile; C. Burman, Peerless; F. E. Wing, Marmon; G. G. Buse, Packard; trophy retained by Percy P. Pierce.

1905—Starters, 34; finishers, 27; complying with all requirements of rules, 20; winner, Percy P. Pierce, Pierce Arrow.

1904—Entries, 77; finishers, 66; no prize offered, this being the run from New York to the St. Louis world's fair.

ONLY ONE CAR PENALIZED FIRST DAY

TOLEDO, O., July 10—Special telegram—In the first day's run of the tour only one of the cars contesting for the Glidden trophy received a penalization—No. 7, a Welch entered under the colors of the Detroit Automobile Club. The penalization of 12 points on this car was because of an accident at a point 92 miles out of Cleveland. The car was approaching a narrow iron bridge in a cloud of dust and as it entered on the bridge the driver saw a group of three boys standing on the other end. It was strike the boys or put the car into the left side of the bridge. In following the latter course the left front hub cap caught in one of the iron uprights and the axle was badly bent, necessitating removing it bodily and carrying it to a blacksmith shop half a mile ahead, where it was straightened out. After a delay of 1 hour 30 minutes the car was on its way again and had made up the delay. On entering Toledo, however, it reached the swing bridge just as it was opening and a delay of 12 minutes followed, which made the car 10 minutes late at the checking station. The remaining 2 points of the car's penalization were caused by the replacement of a pin in a valve stem which was broken at the time of the collision.

By DAVID BEECROFT
Staff Correspondent

In the cars contesting for the Hower trophy there are at present eleven perfect scores—100, 102, 104, 106, 107, 108, 111, 112, 113, 114, 115. No. 109 has 24 points penalization on time caused by an open swing bridge entering Toledo. No. 103 had a perfect score on time but its parts card was missing and the officials did not know if it had any parts penalization. No. 105 is a non-contestant.

Of the cars running but which are non-contestants for the Glidden trophy in that they are not members of any teams but are striving for a Glidden certificate of performance 10, 15 and 51 had perfect scores and 50, a Deere-Clark, has not reported at 6 o'clock, but was passed by the Motor Age Packard Thirty when it was on the side of the road with the right front wheel jacked up. Reports have it it has trouble with its steering mechanism.

The three press cars, 90, 91 and 92, which are not contesting for the Glidden trophy or certificates of performance, all came through on time except 92, a Haynes which had a key on a motor shaft shear off, necessitating a lengthy delay. This is an old car that has been used for a long time for demonstrating purposes by the Haynes representatives in New York.

The Continental car, No. 109, was a victim of an accident in which one side of its frame was broken, but a speedy repair was effected by calling into service a spring repairer, which was part of the car's equipment. The accident in which this car figured was caused by another car attempting to pass it in which to avoid accident compelled it to crowd into some boulders upon the side of the road.

Chairman Hower has received an official protest from the driver of the Continental which will be considered later.

The Meteor car, No. 37, was passed 77 miles out of Cleveland, where it was at the side of the road with the mechanics working at the left side of it. As this car had a perfect score the work was necessarily slight. No. 113, Branstetter's Dragon, had two punctures, both of which were quickly repaired. The Lozier had some trouble with the universal joint a few miles out of Toledo, but was at the checking stand ahead of time in good shape. There were several cases of cars stopped to clean spark plugs and a few cases of other minor troubles which did not cause much loss of time.

MAP OF ROUTE FROM CLEVELAND TO TOLEDO FOLLOWED THE FIRST DAY BY THE GLIDDENITES

BUSY TIMES THE DAY BEFORE AT CLEVELAND

By E. RALPH ESTEP Special Correspondent

CLEVELAND, O., July 9—The A. A. A. tour was the biggest thing in Cleveland today. The clans gathered quickly and occupied the Hollenden from sub-cellar to roof garden. More than 200 of the elect, including press agents and newspaper men, cluttered the lobby, begged the magnate at the desk for rooms, held converse with the committee upstairs and flooded over into the streets. Cars appeared from nowhere and everywhere. Proud owners and dignified mechanics—pardon, mechanicians—tacked numbers to tonneaus and flags to lamps. By noon one was not a real motorist in Cleveland unless his car proclaimed "A. A. A. 23," or something of that sort.

F. B. HOWER, CHAIRMAN A. A. A. TOURING BOARD

Genial Dai Lewis, assisted by the Ernest Ferguson, tended bar at headquarters, dispensing numbers, badges, information and the glad hand. Chairman Hower circulated like a one-night-stand melodrama and kept a Napoleonic eye on the whole job. The tourists made merry to suit their divers ideas and the "what'll ye have" corner was busy. Bell boys reaped a magnificent harvest; waiters were exceptionally deferential; long distance telephones waxed rich, and all day long was heard the incesstant bawling of names by the telegraph page.

Motordom had centered in Cleveland and its biggest affair of the year was as well advertised locally as if the whole thing had moved here to live. A new kind of motorphobia was given being by sundry travelers of other purpose who asked the "house" for rooms, only to become innocent bystanders. The press men were especially strong in numbers and other characteristics. The day had not passed the bacon-and-eggs hour before their messages to the outer world woke the telegraph girls to the fact that they had an endurance job cut out for them and spread the fame of the tour to anxious readers and advertising managers almost everywhere. Surely the present Glidden tour wants not press agents.

Side shows arose to whet the interest of the gossipers and stimulate the news sense of photographers and writers. The Berliet and Elmore companies prepared for combination sealed-bonnet-Glidden tours and one interesting press agent started his big noise by rigging his car with a cannon.

During the afternonn the scene in front of the hotel was a brilliant one. Cars of gay colors lined Superior avenue on both sides. Women in motor costumes came and went while those in Cleveland clothes loitered to add the needed touch of local color. Camera men hustled for feature pictures and sought eagerly to catch the likenesses of Glidden celebrities. The baseball bulletin across the way was deserted whenever a new car hove in sight and the populace discussed six-cylinders, three A's and four-car teams. Some of them learned that the object o- the tour is to enable an A. A. U. member to select a car fitted to his requirement, it being safe to purchase any car that completes the run; that clubs had teams of from thre to eight cars, the bigest ones being that of the New York Motor Club and the Cleveland A. C., and that the latest reports showed a total entry list of eighty-two. Then the wise ones speculated on the number of actual starters the morrow would bring forth and agreed on seventy-five as about the right figure.

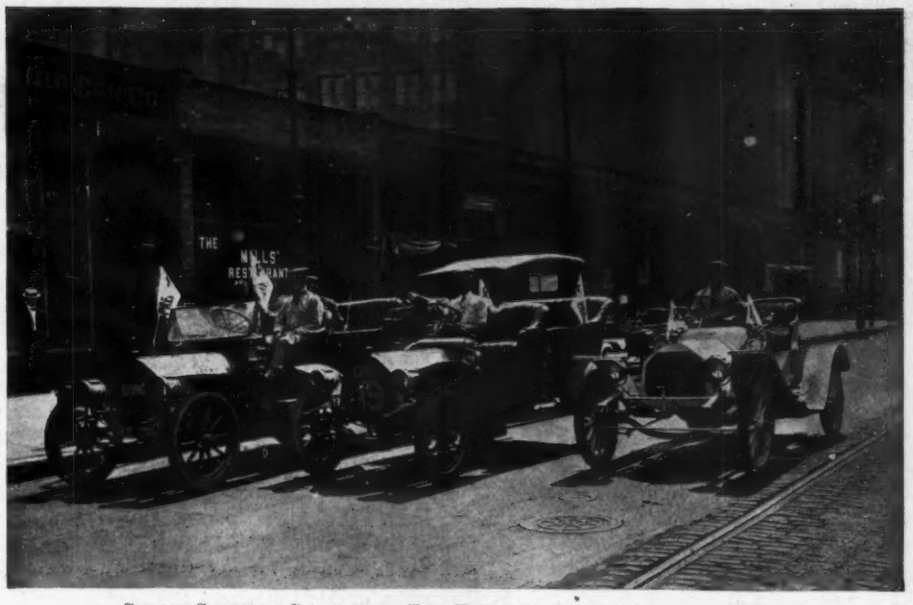
About 5 o'clock Captain Hower gathered the players about him in the committee room and, supported by First-baseman Ferguson, explained the ground rules to them. Such points as checking in and out and going slowly through Elyria were clearly explained. Entrants also were warned against racing on the road. They were told that doctors would be in cars 3 and 19 and to watch out for the red cross signs. Each man was cautioned that the use of spare parts other than those scheduled meant instant disqualification, but great secrecy was made of what each entrant had scheduled, despite the vigorous efforts of enterprising newspaper men. Finally Mr. Hower told the entrants that upon arriving at each night stop and properly putting their respective cars into hock with the officials, they should tell the hotel clerk their numbers, get their keys and go straight to their rooms. E. E. Swartzkopf fainted and other poker tourists held hurried consultation.

The official list of entries up to 6 o'clock tonight shows a total of eighty-one, forty-seven of which are team contestants for the Glidden trophy, fourteen are non-contestant touring cars in that they do not belong to a club team, thirteen are contestants for the Hower trophy, two are non-contestant Hower runabouts and five are official cars—three for the press, one

SECRETARY LEWIS AND HELPERS HANDING OUT NUMBERS, BADGES, ETC., AT HEADQUARTERS

for the officials and one for Chairman Hower. The three press cars are Nos. 90, 91 and 92. The forty-seven Glidden contestants represent eight clubs, of which number the New York Motor Club is the leader with eleven and the others in order are Cleveland Automobile Club, nine; Chicago Automobile Club, seven; Buffalo Automobile Club, five; Pittsburg Automobile Club, four; Automobile Club of America, four; Detroit Automobile Club, four, and Westchester Automobile Club, three. During the afternoon there was much switching of cars from one club to another, among which might be noted No. 23, H. C. Shoemaker, originally entered under the Chicago Motor Club, but transferred to the Cleveland Automobile Club; No. 30, H. M. Coale, from the Quaker City Motor Club to the New York Motor Club; No. 31, E. S. Lea, from the Mercer County Automobile Club to the New York Motor Club; No. 32, W. J. Hower, also came under the colors of the New York Motor Club. No. 34, R. L. Lockwood, transferred from the Automobile Club of America to the New York Motor Club. No. 37, A. L. Peterson, changed from the Indianapolis Automobile Club to the Cleveland Automobile Club. No. 47, Walter C. White, transferred from the Chicago Automobile Club to the Cleveland Automobile Club. White transferred his entry to the team of the Cleveland Automobile Club because steam cars have been barred from competing in what is ostensibly an open race meet to be conducted by the Chicago Automobile Club on July 12 and 13, the dates when the tourists are to be in Chicago. Mr. White, in explaining the transfer of his entry, said: "We had anticipated entering some of the classes at Chicago, as we were attracted by the announcement that there was to be a 24-hour race for the American championship, a free-for-all, time trials, and other events which would presumably be open to all comers. When I learned today that a clause had been slipped into the rules to the effect that 'all events are open to gasoline cars only,' I promptly decided I did not wish to represent in this tour an organization conducting such an unsportsmanlike event, and transferred my entry accordingly."

During the evening the crowd broke to its many pursuits, as at show time. Garages all over town were busy with eleventh hour preparations, spark plug cleaning and endless tuning and fixing and tinkering. Nervous new ones to the game began to show the effect of the waiting and took on the air of volunteers lying in the trenches wondering how the battle would feel when it started. The few women among the tourists retired early to be brave and ready for the reveille. Those who by long experience have become inured to arduous touring gathered to swap tales of previous runs, discuss roads and schedules, renew acquaintances, wager on their respective abilities to be first at the starting line, and argue with the management about rules and their interpretation. The photographers packed their outfits, the war correspondents wired home the latest maneuvers and the press agents wrote reams and reams.



STREET SCENE IN CLEVELAND—THE THREE PREMIERS ENTERED FOR TOUR

The hospitality of the Cleveland Automobile Club was extended to all and in the club quarters at the hotel an informal smoker brought a large percentage of the tourists close together. The tired officials toiled late and strenuously, preparing the records, lists, schedules and what not of starting off the procession in the morning.

P. S. FLINN AND J. H. BECKER, TWO GLIDDENITES

A few hours of sleep all around and then off would go the tour to Toledo, South Bend, Chicago, Indianapolis, Columbus, Pittsburg, Bedford Springs, Baltimore, Philadelphia and old New York.

Not so large in number of cars as last year, the tour to be promises greater results in widely advertising the motor car as a means of touring, and greater satisfaction to all those who have entered it for the promotion of clean, hearty competition, combined with the most modern of all pastimes.

Mr. Glidden, least assuming of all those present, must have felt the elation of knowing success when he sauntered through the Hollenden and saw the evidence of a great growth of his embryonic idea. This tour will be a hummer.

Veterans of other tours abounded and there were many experiences meetings held. Those who had been on the famous trip from New York to St. Louis recounted their adventures to the newer generation with considerable gusto. Survivors of the first contest for the Glidden when it went up through New Hampshire were not slow to tell of their troubles and Constable Quinn must have experienced a tingling sensation in the region of the ears, for the story of the funeral procession through his town after he had made so many arrests was told many times. Probably the most notable absentee was Percy P. Pierce, holder of the Glidden, who is not on the list this year—the first time he has missed the trip. Pierce is a bicycle magnate now and his duties as president of the concern making Pierce wheels are strenuous enough to keep him tied down to his desk while his old comrades are busily engaged in striving for the glory of a perfect score in this year's tour for the Glidden trophy.

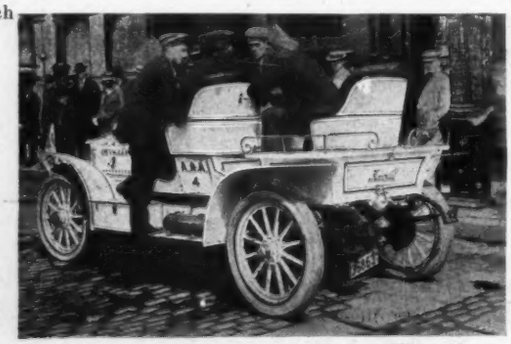
PREPARATIONS AMONG THE CONTESTANTS

By DAVID BEECROFT
Staff Correspondent

PUTTING ON A NUMBER

CLEVELAND, O., July 9—Promptly at 5 o'clock at the A. A. A. headquarters, Chairman Hower addressed the various contestants on the interpretation of the rules, to which he added the following information: Chicago headquarters will be located at the Chicago Automobile Club, 13-17 Plymouth court. It being impossible to park the cars while in Chicago, the A. A. A. has rented the First regiment armory, Sixteenth street and Michigan avenue, and to defray the expenses a $5 garage charge has been placed on each contestant, this amount to cover the entire stay in Chicago. Contestants must drive carefully through Elyria, averaging 8 miles per hour—for police traps are in operation due to recent motoring accidents at this point. Daily schedules are based on 20 miles per hour in the country and 10 miles per hour in towns. This schedule is for fair weather and additional time will be given in case of muddy roads. Racing between contestants on the roads is prohibited. A car, maintaining an average pace and overtaken by another contestant who signals to get past, must take the right side of the road, giving the other an opportunity to pass. The pilot car goes 2 hours ahead of the first car each day. Physicians are carried in cars No. 3 and 19. No penalization is placed upon repairs or replacements of clocks, lamps, horns, odometers, tire chains or tires. Penalizations are placed on repairs or replacements of shock absorbers, they being classed as springs. Any parts replaced on the tour and which parts are not entered in the inventory carried by the car will lead to the immediate placing of that car in the non-contestant ranks. In places where cars have to be parked over night, tops and other night protectors must be put in place before checking in. These must be removed before checking out the following morning. Cars do not check out in numerical order in the morning, but according to the order in which they reach the starting point, from which they are dispatched at 1-minute intervals by E. L. Ferguson. Car No. 3 will always start second each morning, as it carries the night watches. The rule is that at every morning start cars will check out from the garage and the schedule allows sufficient time for taking on passengers and baggage at the hotel. In checking in at the evening, the schedule allows 5 minutes for passengers to dismount at the hotel and for the removal of the baggage, as well as time to reach the garage at a rate of 10 miles an hour. On the arrival of each car at the hotel at night, Secretary Dai H. Lewis hands each contestant a card showing the name of his hotel and the number of the room assigned to him, after which the contestant will present this card to the hotel clerk and register in the general manner. The cars run on central time until reaching Pittsburg, after which eastern time will be used. Headquarters in Columbus, O., have been changed to the Hartland hotel. Cars check out each morning at 7 o'clock.

In a cursory glance over the many cars as they present themselves at the Hollenden entrance to receive their official numbers and flags, the determination of the contestants to make a successful run is evidenced by the many precautions taken. An example of this appears in No. 39, a Berliet entered by Arthur N. Jervis, which car is specially equipped for muddy roads. Foremost in this equipment is a set of three leather fenders to prevent mud reaching the radiator. Two of these are forward continuations of the mud flap uniting the fender with the frame of the car and they extend forward in front of the wheel. The third is a cross strip of leather between the frame pieces and extending from the apron of the car forward to a point well in front of the radiator. Strapped on the left running board of this car are two 8-foot 2-inch oak skids, which can be used in case the car gets into a ditch. Additional interest of a non-Glidden nature attaches to this car in that its bonnet was officially sealed by a committee consisting of Al Reeves, Duncan Curry and D. Beecroft, it being the intention of the driver to make the entire run without raising the hood. In the tonneau of No. 9, a Thomas Flyer, entered by George S. Salzman, is an immense coil of rope, as well as a ditcher's shovel. Gasoline precautions are evident on several cars, among which was noted No. 17, a six-cylinder Pierce, with a large-sized gasoline tank carried on the left running board and held there by wood brackets and straps. No. 13, a Thomas Flyer, is similarly equipped. Practically every car carries two extra tire casings but No. 25, a Lozier, has double this capacity, carrying two at the right of the driver on the running board and two in the rear of the tonneau. Tire inflation tanks are the equipment of practically every car on the tour and as a supplementary system for emergencies one or two tire pumps are used. On the majority of cars the tire tank is placed on the running board but a Maxwell entry, No. 41, has it placed transversely on the left end of the foot board.



THE MAXWELL CONFETTI CAR

WOMEN WITH THE FLINN PARTY

During the afternoon all of the contestants presented their list of spare parts carried, together with the price of each and attested to the correctness of this inventory. It was the intention of Motor Age to publish a detailed list of the parts carried by every car but Chairman Hower has refused to make this information public until the completion of the tour, his reason for it being that many of the entrants do not wish the facts made known. As the time passes, however, many facts regarding inventories leak out and it appears that the majority of cars are taking along a dozen spark plugs, an extra spring, extra wheel, bearings, additional timers and other parts. A few have provided themselves with additional brake bands. The contestants followed the remarks of Chairman Hower with great interest and anyone in doubt did not hesitate to ask questions. The meeting broke up with good feeling on all sides and the belief that the tour would be an unqualified success in every way.

STARTERS IN FOURTH ANNUAL AMERICAN AUTOMOBILE ASSOCIATION TOUR

Car No.	Entrant	Club	Car	H. P.	Glidden	Hower	Non-Contestant
1	N. H. Van Sicklen	Chicago Automobile Club	Apperson	40-45	Yes		
2	K. R. Otis	Cleveland Automobile Club	Pierce Great Arrow	60-65	Yes		
3	R. D. Garden	New York Motor Club	Pierce Great Arrow	40-45	Yes		
4	H. A. Grant	Westchester Motor Club	Maxwell	36-40			Yes
6	T. J. Clark	Chicago Automobile Club	Packard	30	Yes		
7	A. R. Welch	Automobile Club of Detroit	Welch	50	Yes		
9	George S. Salzman	Automobile Club of Buffalo	Thomas Flyer	60	Yes		
10	F. J. Pardee	St. Louis Automobile Club	American Mors	24	Yes		
11	Montgomery Hallowell	Automobile Club of Buffalo	Thomas Flyer	60	Yes		
12	R. D. Chapin	Automobile Club of Detroit	Thomas Forty	40	Yes		
13	George M. Davis	Automobile Club of Buffalo	Thomas Flyer	60			Yes
14	Philip S. Flinn	Pittsburg Automobile Club	Pierce Great Arrow	40-45	Yes		
15	G. Cabanne	St. Louis Automobile Club	American Mors	24	Yes		
16	Orrel A. Parker	Automobile Club of America	Royal Tourist	45	Yes		
17	F. S. Dey	Automobile Club of Buffalo	Pierce Great Arrow	60-65	Yes		
19	T. W. Moore	Automobile Club of America	Premier	24	Yes		
21	Thomas P. Jones	Pittsburg Automobile Club	Pierce Great Arrow	40-45	Yes		
22	H. H. Perkins	Pittsburg Automobile Club	Packard	30	Yes		
23	H. C. Shoemaker	Cleveland Automobile Club	Shoemaker	35-40	Yes		
24	W. M. Lewis	Chicago Automobile Club	Mitchell	30	Yes		
25	S. Black	Cleveland Automobile Club	Lozier	40	Yes		
26	A. Cuneo	New York Motor Club	Rainier	30-35	Yes		
27	A. Kumpf	Automobile Club of Buffalo	Pierce Great Arrow	40-45	Yes		
28	P. Gaeth	Cleveland Automobile Club	Gaeth	35	Yes		
29	G. P. Moore	Pittsburg Automobile Club	Welch	50	Yes		
30	H. M. Coale	New York Motor Club	Autocar	30	Yes		
31	E. S. Lea	New York Motor Club	Walter	40	Yes		
32	W. J. Howard	New York Motor Club	Oldsmobile A	40	Yes		
33	R. M. Owen	Automobile Club of America	Reo	16	Yes		
34	R. L. Lockwood	New York Motor Club	Reo	16	Yes		
35	R. A. Rainey	Automobile Club of America	Reo	16	Yes		
36	E. B. Finch	Automobile Club of Detroit	Pungs-Finch	40	Yes		
37	A. L. Petersen	Cleveland Automobile Club	Meteor	50	Yes		
38	H. C. Tillotson	Chicago Automobile Club	Stoddard-Dayton	35	Yes		
39	Arthur N. Jervis	New York Motor Club	Berliet	40	Yes		
40	R. H. Johnston	New York Motor Club	White	18			Yes
41	I. C. Kirkham	Westchester Motor Club	Maxwell	16-20	Yes		
42	R. H. Tucker	Cleveland Automobile Club	Royal Tourist	45	Yes		
43	J. W. Mears	Richmond Co. Auto Club of N. Y.	Acme	40	Yes		
44	Gus G. Buse	Automobile Club of Buffalo	Packard	24	Yes		
45	A. M. Robbins	New York Motor Club	Aerocar	40	Yes		
46	George F. Barr	Automobile Club of Detroit	Aerocar	40	Yes		
47	Walter C. White	Cleveland Automobile Club	White	30	Yes		
48	A. J. Scaife	New York Motor Club	White	20	Yes		
49	Charles H. Burman	Cleveland Automobile Club	Peerless	30	Yes		
50	W. C. Straub	Cleveland Automobile Club	Peerless	30	Yes		
51	J. H. Becker	Cleveland Automobile Club	Elmore	30-35			Yes
52	William G. Houck	Automobile Club of America	Deere	30-35			Yes
54	Edward Noble	Chicago Automobile Club	Haynes	50	Yes		
55	F. N. Nutt	Chicago Automobile Club	Haynes	30	Yes		
56	F. E. Dayton	Chicago Automobile Club	Columbia	40-45	Yes		
58	Lucius S. Tyler	Westchester Motor Club	Maxwell	16-20	Yes		
59	Charles A. Fleming	Westchester Motor Club	Maxwell	24	Yes		
60	William Turner		Thomas Flyer	60			Yes
61	H. G. Smith		White	24			Yes
62	W. A. Badger	Cleveland Automobile Club	Cleveland	30-35		Yes	
90	Press, Motor Age		Packard	30			Yes
91	Press, Automobile		Aerocar	40			Yes
92	Press		Haynes	50			Yes
98	Official		Premier	50			Yes
99	Chairman		Pierce	50			Yes
100	A. E. Hughes	Rhode Island Automobile Club	Pierce Runabout	40-45		Yes	
102	H. E. Coffin	Automobile Club of Detroit	Thomas Forty	40		Yes	
103	H. O. Smith	Indianapolis Automobile Club	Premier runabout	24		Yes	
104	G. S. Smith	Quaker City Motor Club	Stoddard-Dayton	35		Yes	
105	J. C. Zimmerman	Chicago Motor Club	Locomobile runabout	35			Yes
106	R. G. Kelsey	Long Island Automobile Club	Matheson	40-45		Yes	
107	Harry C. Stutz	American Automobile Association	Marion	24		Yes	
108	H. K. Sheridan	Cleveland Automobile Club	White	30		Yes	
109	C. S. Johnston	American Automobile Association	Continental	35		Yes	
111	Wallace Owen	Cleveland Automobile Club	Pennsylvania	35	Yes		
112	J. W. Haynes	Chicago Automobile Club	Dragon	24		Yes	
113	H. P. Branstetter	Chicago Motor Club	Dragon	24		Yes	
114	J. G. Barclay	Automobile Club of Buffalo	Thomas Forty	40		Yes	

SCRATCHES—No. 5, A. L. Kull, New York Motor Club, Dragon, non-contestant; No. 8, C. E. Finlay, Associated Automobile Clubs of New Jersey, Pierce Great Arrow, non-contestant; No. 20, J. K. Mills, Quaker City Motor Club, Dragon, non-contestant; No. 18, H. Pauliman, Chicago Motor Club, Pierce Great Arrow, Glidden; No. 53, Deere-Clark Motor Car Co., Deere, non-contestant; No. 57, A. D. Cressler, Chicago Motor Club, Thomas Flyer, non-contestant; No. 101, C. A. Coey, Chicago Automobile Club, Thomas Flyer, Hower; No. 110, A. B. Tucker, New York Motor Club, Dragon, non-contestant.

All but one of the Glidden trophy contestants had perfect scores the first day, No. 7, a Welch, being penalized 12 points for being late at Toledo. No. 109, a Continental in the Hower trophy contest, was penalized 24 points for being late at Toledo.

MAKEUP OF EIGHT TEAMS CONTESTING FOR GLIDDEN TROPHY

NEW YORK MOTOR CLUB TEAM, NINE

No. 3—R. D. Garden, Pierce Great Arrow
No. 26—A. Cuneo, Rainier
No. 30—H. M. Coale, Autocar
No. 31—E. S. Lea, Walter
No. 32—W. J. Howard, Oldsmobile
No. 34—R. L. Lockwood, Reo
No. 39—A. N. Jervis, Berliet
No. 45—A. M. Robbins, Aerocar
No. 48—A. J. Scaife, White

CHICAGO AUTOMOBILE CLUB, SEVEN

No. 1—N. H. Van Sicklen, Apperson
No. 6—T. J. Clark, Packard
No. 24—W. M. Lewis, Mitchell
No. 38—H. C. Tillotson, Stoddard-Dayton
No. 54—Edward Noble, Haynes
No. 55—F. N. Nutt, Haynes
No. 56—F. E. Dayton, Columbia

CLEVELAND AUTOMOBILE CLUB, NINE

No. 2—K. R. Otis, Pierce Great Arrow
No. 23—H. C. Shoemaker, Shoemaker
No. 25—S. Black, Lozier
No. 28—P. Gaeth, Gaeth
No. 37—A. L. Peterson, Meteor
No. 42—R. H. Tucker, Royal Tourist
No. 47—W. C. White, White
No. 49—C. H. Burman, Peerless
No. 50—W. C. Straub, Peerless

AUTOMOBILE CLUB OF BUFFALO, FIVE

No. 9—G. S. Salzman, Thomas Flyer
No. 11—M. Hallowell, Thomas Flyer
No. 17—F. S. Dey, Pierce Great Arrow
No. 27—A. Kumpf, Pierce Great Arrow
No. 44—G. G. Buse, Packard

AUTOMOBILE CLUB OF AMERICA, FOUR

No. 16—O. A. Parker, Royal Tourist
No. 33—R. M. Owen, Reo
No. 35—R. L. Lockwood, Reo
No. 51—W. G. Houck, Deere

DETROIT AUTOMOBILE CLUB, FOUR

No. 7—A. R. Welch, Welch
No. 12—R. D. Chapin, Thomas Forty
No. 36—E. B. Finch, Pungs-Finch
No. 46—G. F. Barr, Aerocar

PITTSBURG AUTOMOBILE CLUB, FOUR

No. 14—P. S. Flinn, Pierce Great Arrow
No. 21—T. P. Jones, Pierce Great Arrow
No. 22—H. H. Perkins, Packard
No. 29—G. P. Moore, Welch

WESTCHESTER AUTOMOBILE CLUB, THREE

No. 41—I. C. Kirkham, Maxwell
No. 58—L. S. Tyler, Maxwell
No. 59—C. A. Fleming, Maxwell

NEW HOME OF CHICAGO AUTOMOBILE CLUB

EXTERIOR VIEW OF NEW CLUB HOUSE

LOUNGING ROOM ON SECOND FLOOR, WITH HUGE FIREPLACE IN EACH END

NO more refreshing variation from the stiff architecture of the surrounding skyscrapers could be imagined than the simple colonial lines of the new home of the Chicago Automobile Club at 13-17 Plymouth court, which was thrown open to the members July 2. Its dark front, with trimmings of gray stone, is relieved by green shutters of old-fashioned style, while long window boxes line the small iron balconies beneath the French windows on the second floor. The windows are all of small-paned glass.

So much of the main floor was given over to garage storage space that the second floor was made the focal point of the structure, the main lounging room extending across the entire front of the building, with the cloak and toilet rooms conveniently adjacent. The general office is also located on this floor. Soft shades of gray and green give the keynote in the lounging room, the woodwork being enameled in gray and the furniture finished in silver gray oak, upholstered in a Spanish leather in softly blending tones of green and brown.

For the reception of fair woman a small waiting room opens directly from the elevator, from which a short flight of stairs leads to the café on the floor above. The women's room is in the style of Louis XVI, decorated in delicate shades of rose and gray. Gray enameled furniture, with cane seats and backs, is in harmony with the decorations.

In sharp contrast to the soft-toned lounging room is the main café, which extends across the third floor frontage. Its adornment is distinctly stunning in color, with a deep red much in evidence on the paneled walls and in the upholstery of the moss-green oak furniture. The ceiling is heavily beamed after the old English style, in a shade which the decorator dubbed "Dutch olive." The windows are comparatively small, curtained in ecru net, with hangings of red velvet, bordered in gray leather. The kitchen, which is located on this floor, is thoroughly equipped with every facility needed to make the C. A. C. cuisine one of the most popular features of the club.

Once upon a time, so the directors of the club relate, is was planned to seg-

ONE OF THE COZY SLEEPING APARTMENTS

SHOWING THE CLUB'S IMMACULATE KITCHEN

CORNER OF CAFE ON THIRD FLOOR

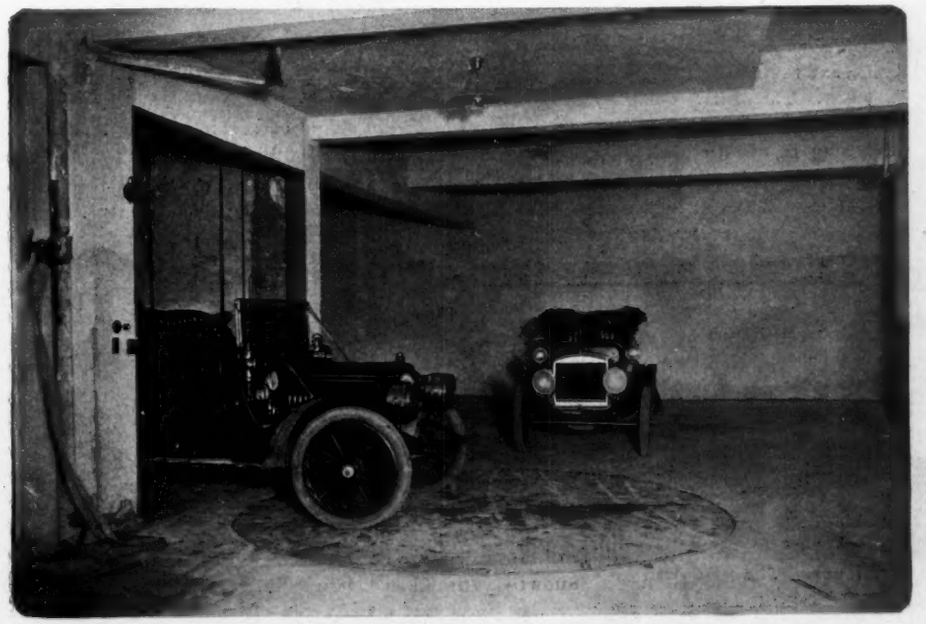
GRILL ROOM LOCATED IN BASEMENT

regate the women who ventured within the C. A. C. domain in one corner of the main café, but the directors had reckoned without their host. Rebellion followed speedily, and in consequence women are allowed to roam at will throughout the cafe.

Thoroughly individual treatment was employed in equipping the sleeping apartments on the upper floors, and although every comfort known to the most luxurious modern hotels is provided there is none of the conventional sameness which distinguishes the twentieth century hostelry. The color schemes were selected by Mrs. Ira M. Cobe, wife of the chief executive of the club, and the wallpapers, carpets and window hangings all are in harmony. The furniture is of colonial type in mahogany, while the bedsteads are of brass. In the woodwork in the bachelors' apartment is introduced one of a number of distinct innovations to be found throughout the building—the use of mahogany doors, window sills and quarter-round trim in connection with woodwork of white enamel.

For those members who seek a departure from the usual thing in dining halls the rathskeller makes its especial appeal, and here—except on an occasional women's night—the male members of the club will rule alone. The grill occupies the basement and extends outward beneath the sidewalk in order to secure some measure of daylight. There is little woodwork to be found except for china closets which line parts of two walls, and the cement walls and supporting columns are painted gray and scored in imitation of stone. The architects say the idea was borrowed from the German weinstube. A frieze of colonial style surrounds the room. The furniture in the grill is of green oak and billiard and pool tables finished in the same style occupy prominent positions in the center of the room. They are not likely to remain there long, however, as the board of managers has decreed that they shall be moved into an adjacent room which was originally designed for use as a bowling alley. The demand manifested for the tenpin sport has proved so slight it has been decided not to install the four alleys originally contracted for, and in consequence that space—which was far from inconsiderable—will be available for the expansion of the grill room and the billiard room. The storerooms, engine and boiler rooms and coal bunkers are tucked away in the rear of the building.

What is practically a separate structure, three stories in height and separated from the main building by a continuous fire-wall, is employed for the storage of the cars. The garage has accommodations for some sixty machines, communication between the different floors being made possible by the use of a 4-ton machine hoist. A turntable on each floor makes it possible to dispose of the cars without unnecessary waste of space.



VIEW SHOWING TURNTABLE AND ELEVATOR IN GARAGE

ENTRANCE TO THE CLUB

BOSTON HAS ROAD TEST

Twenty-Two Out of Thirty-Three Cars Go Clean in the Bay State A. A. Reliabity Run

Boston, Mass., July 6—Twenty-two of the thirty-three cars that started today in the endurance run of the Bay State A. A. from Boston to Keene, N. H., returned here after a 207-mile trip, with perfect scores. It was the first run of its kind ever held in New England and it proved a big success. Ten of the machines had points scored against them for various troubles but the committee having the run in charge did not get a chance to make out a complete score. This will be done later when the committee has a meeting for that purpose in this city some time next week.

Those with clean scores in the runabout class were: Arthur A. Knights, Oldsmobile; Horald Brown, Peerless; Harold Church, Shawmut; E. F. Buffum, Craig-Toledo; James Corbett, Corbin.

In the touring car division the perfect scores were made by Harry Harris, Winton; E. F. Dodge, Pope-Hartford; Harry Walover, Columbia; V. A. Charles, Rambler; R. R. Ross, Peerless; Frank E. Wing, Marmon; C. F. Whitney, Berliet; C. Krow, Cadillac; Louis Grout, Grout; C. F. Whitney, Stoddard-Dayton; W. A. Daniels, Studebaker; Frank Crockett, Knox; W. E. Wright, Knox; Ralph Mulford, Lozier; J. E. Brennan, Rambler; F. R. Parker, Elmore.

Cars finishing with marks against them were: Corbin, Bay State Forty, Grout, Jackson, Cadillac, American, Maxwell, Dragon, Rainier, American Mors and Aerocar. All the cars made the first control without any trouble where they were checked out by Mr. Wheeler. Once more they were on their way headed for Dublin, N. H. That was quite a distance off and the cars were allowed 3 hours to travel to that place. The sun was well up by the time they were half way there. The route led through Littleton, Groton, Townsend, Rindge, East Jaffrey to Dublin. At Dublin they were sent off again for Keene and the cars were given 1 hour 15 minutes to reach there.

The first car got into Keene shortly after 11 and it was greeted with enthusiasm. One hour was allowed for lunch at that place. Shortly after midday the first car checked out for the return home. The route led through Winchester to Orange.

At Orange another checking station was located. Two hours was allowed the drivers to get their cars to that place. From Orange the route called for a run through Athol, Templeton, East Templeton, Gardner, Westminster to Fitchburg. At the latter place there was another control and the scenes at Keene were duplicated. The run to that city was made in 1 hour 55 minutes schedule time.

Leaving there the cars were sent along through Leominster, Bolton, Stow, and Maynard to Concord again, where there was another halt.

BIG ROAD PLANNED

St. Louis, July 8—At a meeting of the state board of agriculture in St. Louis Curtis Hill was appointed state highway engineer and instructed to begin immediately the survey of the $500,000 macadamized public road between St. Louis and Kansas City. The board authorized the announcement that construction work on the highway will begin early next spring, and that the road will be completed within 2 years. The last legislature appropriated $500,000 to build the road, in addition to allotting $4,113 to each of the 114 counties for road improvement. The meeting of the state board which selected Mr. Hill as highway engineer was presided over by Governor Joseph W. Folk, whose active interest in the good roads movement has resulted in the appropriation of $1,000,000 for highway improvement in the state. As soon as the road between Kansas City and St. Louis is completed another extending from north to south through the state will be undertaken. The most favored route suggested is from St. Louis to St. Charles, thence to Warrenton, Danville, Fulton, Columbia, crossing the river at Boonville, and thence to Kansas City by way of Independence. The road will be 60 feet wide.

LINEUP OF CARS IN BAY STATE RELIABILITY RUN

BIG TIME IN JERSEY

Reliabity Run, Races and Show Figure in Wildwood's Celebration of the Fourth

Wildwood-by-the-Sea, N. J., July 4—As a medium for popularizing a summer resort the motor car has any other method backed off the boards. There are over 20,000 people here tonight, fully half of whom came down specially to see today's races on the Central avenue boulevard. Today's races, which featured the last day of the carnival, were a huge success, and although the dust bothered the contestants not a little and there were one or two soft spots on the wide and level boulevard, there were no accidents to mar the occasion. Preliminary to the meet was a reliability race yesterday from Gloucester.

The big 120-horsepower Vanderbilt cup Thomas Flyer did the special speed stunts of the meet—46 seconds in the free-for-all and 44 seconds in the special time trial for the citizens' cup. The course was not sufficiently long for Roberts to maintain speed to the finish, the boulevard ending a scant 100 yards beyond the tape, and Montague did not care to take any chances. As a consequence he coasted the last third of the mile course on both occasions. Some other good times were made—46 seconds by the Thomas Flyer runabout, 52 seconds by the Stanley steamer and 53⅘ seconds by the Stearns. Last night all the participants in the reliability run were installed on the boardwalk, the impromptu show attracting every denizen of the resort. This morning a parade along the ocean front was participated in by about everything in the shape of a self-propelled vehicle in Wildwood—barring the speed merchants, who were getting a line on the course.

The measured mile on Central avenue, which runs the length of the town and is 100 feet wide, was in good condition despite the dust, which apparently refused to succumb to the efforts of a brace of water wagons.

At the close of the races the course was cleared for a series of time trials in an effort to reduce the Thomas Flyer's figures. But Roberts, with plenty of reserve power, seemed to be able to go just about as fast as he pleased, and although none of the others could best his 46 seconds flat in the free-for-all, he managed to stay on the high long enough to go the route in

44 seconds flat, when the races were brought to a close with all hands satisfied with the outcome. Summary:

Gasoline cars, $1,500 and under—George Vennell, 16-horsepower Reo, won; C. A. Godshalk, 22-horsepower Buick, second. Time, 1:40 2-5.

Gasoline cars, $2,750 and under, Wildwood-by the Sea cup—George P. Parker, 35-horsepower Oldsmobile, won; N. C. Mullen, 30-35-horsepower Wayne, second; W. C. Longstreth, 40-horsepower Maxwell, third. Time, 1:05.

Four-cylinder gasoline cars, $2,000 and under, Elsa cup—C. A. Godshalk, 24-horsepower Buick, won; J. A. Bunn, 24-horsepower Moline, second; William M. David, 24-horsepower Mora, third. Time, 1:40.

Open, cars listing $5,500 and under, founders' cup—Montague Roberts, 60-horsepower Thomas, won; C. W. Hoffman, Stearns, second; Willie Haupt, 60-horsepower Chadwick, third. Time, 1:09 1-5.

Open only to non-club members, participating in reliability run, Hamersly cup—Samuel Cullom, 30-horsepower Packard, won; M. F. Dobbins, Stanley steamer, second; Lester Dykman, Stoddard-Dayton, third. Time, 1:00½.

Free-for-all, Crest cup—M. Roberts, 120-horsepower Thomas Flyer, won; Walter Harper, 30-horsepower Stanley, second; C. W. Hoffman, 30-60-horsepower Stearns, third; Samuel Collom, 30-horsepower Packard, fourth. Time, :46.

Runabouts belonging to Q. C. M. C. members participating in reliability run, Martindale cup—D. W. Harper, Stanley, won; Samuel Collom, 30-horsepower Packard, second; George P. Parker, Oldsmobile, third. Time, 1:06.

Touring cars belonging to Q. C. M. C. members participating in reliability run, Ottens cup—C. W. Hoffman, Stearns, won; Ed Wilkie, Chadwick, second; M. W. Dobbins, Stanley, third. Time, 1:03 4-5.

Gasoline cars, $2,500 and under — Lester Dykman, Stoddard-Dayton, won; W. C. Muller, Wayne, second; C. A. Godshalk, Buick, third. Time, 1:18 1-5.

Special time trial, Citizens' cup—M. Roberts, 120-horsepower Thomas Flyer, won. Time, :44.

Special time trial, fully equipped touring cars—Won by Autocar. Time, 1:18 1-5.

Forty-three cars—twenty-four driven by members of the Quaker City Motor Club and nineteen by unattached owners—left Gloucester yesterday afternoon in a reliability run for this place. The distance won. J. P. Buchanan, in a 30-35 Stoddard-Dayton, captured the honors in the unattached class, with a score of but five demerits. W. C. Longstreth in a Maxwell, George E. Conrad in a Winton, J. J. Harnett in a Reo, Gilbert S. Smith in a Stoddard-Dayton, C. S. Wells in a Pennsylvania and Dr. J. R. Overpeck in a Walter followed in the order named. The board had offered two prizes for the best decorated cars. Finally H. B. Stillman's Pennsylvania in the touring car class and T. R. Randolph's Golden Dragon in the runabouts were chosen.

RUMOR SHOW DATE IS SET

New York, July 10—Special telegram—The Automobile Club of America and the independents admit that they have decided on the date of their Grand Central palace show. The rumor is persistent that the last week in October has been chosen so as to be a week ahead of the garden show.

COLUMBIA HEADS OUT

M. J. Budlong, H. P. Maxim and G. H. Stroud of Electric Vehicle Co. Hand in Resignations

New York, July 10—Special Telegram—Resignations of leading officials which have been placed in the hands of the Electric Vehicle Co. directors will deprive that company of the services of prominent members of the present executive, construction and selling departments. The resignations in question are those of Milton J. Budlong, president; Hiram P. Maxim, chief engineer, and George H. Stroud, sales manager. The resignation of Mr. Budlong is to take effect September 1 and those of Mr. Maxim and Mr. Stroud on August 1. It is denied by one close to the company and the men who have withdrawn that there is any internal war of factions or that the withdrawals of the officials named have any other reasons than that they have other enterprises in view. On his retirement Mr. Budlong will take a vacation trip to Europe. He says he has plans for the future, but that he will not make them public until his return.

THOMAS FLYER IN FAST MILE AT WILDWOOD, N. J.

No successor has yet been appointed. Mr. Budlong is one of the best known men in the motor business in this country. For 9 years he has been connected with the Electric Vehicle Co. in various capacities. He was treasurer, vice-president and general manager and later president, succeeding George H. Day when the latter became manager of the Association of Licensed Automobile Manufacturers. Mr. Budlong was connected with the Pope Mfg. Co. interests in its early days and he later became secretary and treasurer of the Siemens & Halske Electric Co. of Chicago. When Mr. Day became head of the Electric Vehicle Co. Mr. Budlong became the western manager, in which position he remained until he was called to Hartford to take the position of vice-president of the Electric Vehicle Co. He was subsequently elected president of National Association of Automobile Manufacturers and for 4 years has been one of the most active and successful of the younger men in the American motor car industry.

Mr. Maxim will be at the head of a new company for the manufacture of electric vehicles, which organization is well advanced already. Mr. Maxim began designing electric vehicles for Colonel Pope in 1901 and in 1904 became designer for the Electric Vehicle Co. He has designed all its electric cars and its big gasoline cars as well, though H. W. Alden has, under him, designed some of the smaller gasoline models. Mr. Stroud has not yet announced his plans for the future, but he will be connected in no way with Mr. Maxim's enterprise. Justus B. Entz, who designed the combination gasoline-electric car, will continue as second vice-president. Harry W. Kyte, formerly secretary and assistant treasurere, has been made third vice-president.

Thomas F. Ryan and the Whitney estate are the chief owners of the Electric Vehicle Co. They succeeded to the Whitney-Elkins-Widener ownership of the Storage Battery Co., which in 1898 came into the control of the Electric Vehicle Co. The Electric Vehicle Co. derives a large income from its ownership of the Selden patent. The Association of Licensed Automobile Manufacturers, formed to sustain the patent, was organized by George H. Day, then president of the Electric Vehicle Co.

CHANCE FOR CUP RACE

New York, July 9—It is practically settled now that the eliminating trial and final of the Vanderbilt will be run over a New Jersey course on October 5 and 19 respectively. On Thursday night last the New Jersey assembly passed the enabling act without a dissenting voice. Governor Stokes in a conversation with Secretary Elliott and Charles Thaddeus Terry, of the A. A. A., yesterday expressed absolute confidence that the senate at its session tomorrow or Thursday night would pass the bill declaring that the opposition to it in the upper house was but trifling. There promises to be a lively scramble among half a dozen counties in New Jersey for the race and no one county is favored.

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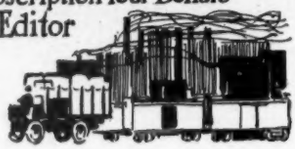


CHANGE IN FASHION

NOTHING could illustrate the decline of popularity of the horse-drawn vehicle as a pleasure affair so well as the fact that at the suburban handicap run at the Sheepshead Bay track there were 740 motor cars inside the grounds and not a single four-in-hand, an occurrence unheard of during the past quarter of a century. Certain it is the coach, popular fad that it was, has seen its last day and that the the motor car has been responsible for putting it on the shelf, along with a good many other things. There is something stupendous in the figures that have been prepared concerning the representation of the more modern means of conveyance. These 740 motor cars are alleged to have represented a value of $3,875,000, and while there was a generous sprinkling of foreign cars, their number being represented by 211, there were 529 American-made cars at this sporting-society event. The fact that people go to horse-races in motor cars does not indicate that their love for horses—and a little horse-race gambling—has diminished, but it does illustrate that as a means of conveyance a motor car ranks next to a Pullman car in most ways and ahead of it in others. This same state of realization will have come upon the commercial world within the next decade, and then the poor horse rather than the motor car will be something of a novelty. The commercial world, naturally enough, perhaps, has not felt so kindly disposed to the motor car as has the pleasure seeker, but some of the facts quoted above must sooner or later make a decided impression.

FORBEARANCE IS ASKED

SUBSCRIBERS to Motor Age are requested to have a little forbearance for a week or so if they find some delay and some irregularity in the matter of the delivery of the paper. Less than a year ago the mailing facilities and subscription record schemes were believed to be so complete that further changes would not be necessary for a long time to come; as a matter of fact, however, the subscription business of Motor Age has grown so extensively that, notwithstanding new and more commodious quarters and other more modern facilities, it has been found necessary to make a complete change in the subscription department in the matter of keeping records and in mailing the papers each week. It can easily be appreciated that to make a complete change is no small task, and so exacting are the postal regulations that some errors are naturally anticipated. A large force is at work night and day making the changes, which will require something like a couple of weeks to complete. Naturally there will be mistakes and possibly some omissions. If readers will promptly notify the office of such, copies will be immediately forwarded, so that the files of subscribers may be kept intact for binding.

MAKING GOOD ALWAYS

TIME has shown that the ordinary demonstration has ceased to be much of a factor in the matter of influencing an intending purchaser of a motor car. He knows that all cars are capable of running in a satisfactory manner and quietly enough to suit the most exacting. But the modern purchaser has come to know that he must have a car that will last him more than one short season, and he naturally is interested in the car that can be put through the most severe trials and apparently suffer nothing of a material nature. Reliability and endurance trials, 24-hour events and other trials that are apt to tax the stability of a car are what are now counted upon as necessary to convince the public that the motor car is something of a business proposition and not a mere plaything. Nowadays such contests have come to prove—not that a car can do what is desired it should do but that some particular car can do just a little more than one of another make, all of which tends to spur the manufacturer to endeavor to put forth his best efforts to place before the public an article that will meet with general approval and fulfill all the requirements that the public may wish and is willing to pay for. It is safe to presume that in time such contests will not have as much importance attached to them as they do now, but beyond showing what the motor car can do, they are features of the publicity end of the business too important to be overlooked.

NOW LET EUROPE TRY

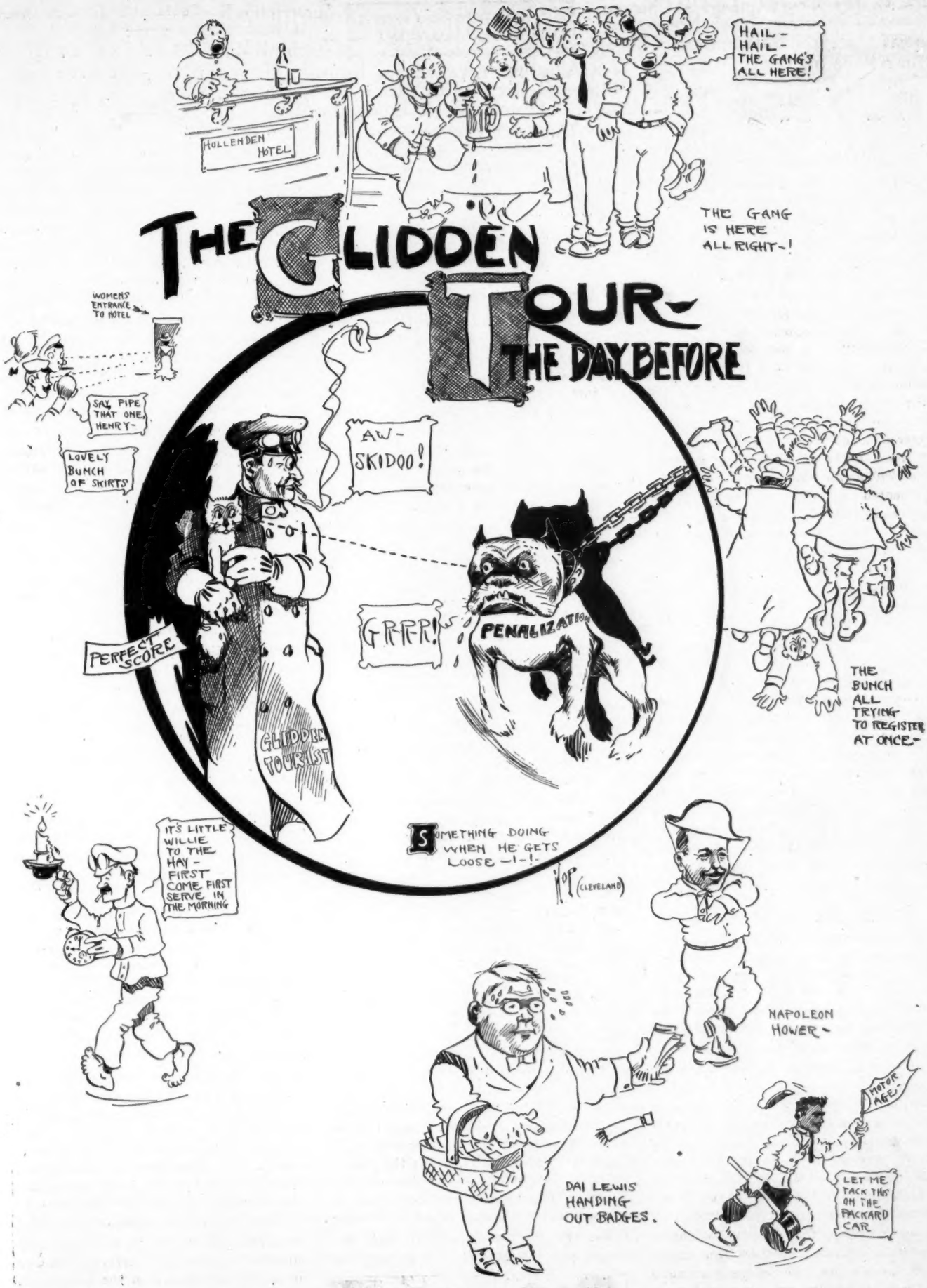
AMERICANS are prone to prate about foreign-made cars and their quality. Motor Age desires to call the attention of the world to the remarkable performance of the Mora car in going through two severe contests and from New York to Chicago and back, nearly 3,000 miles in all, with its bonnet and other parts securely sealed. Yes, this may advertise the car—any car that can do this ought to be advertised and recognized. Motor Age challenges any foreign car to turn the trick.

AN AUSPICIOUS BEGINNING

CHAIRMAN HOWER of the touring board of the American Automobile Association ought to feel contented and relieved—and he ought to be congratulated. His relief should come now that the annual tour has begun and contentment ought to be his reward for making the event the success it appears to be at the beginning. Mr. Hower may be stubborn enough to insist that all along he had the utmost confidence that the tour would be all that it is; as a matter of fact, however, the success of the tour had a most dubious appearance up to a very few days ago—the most optimistic view that could be taken was anything but encouraging. While the 1907 tour is only half the size of the Herkomer in point of number of entrants, it is somewhat ahead of last year's affair in actual starters, notwithstanding more severe rules and a longer route. The first day's run, from Cleveland to Toledo, was comparatively easy and decidedly uninteresting except for the miserable state of Ohio's roads and a superabundance of dust. It is not strange that there should have been so many perfect scores—only one receiving penalization—for certainly the cars started out in the pink of condition. Nor was the one penalization because of mechanical deficiency. The penalization story is not expected to begin in earnest for a week or so, but when the mountain roads shall have been reached it will not be surprising if there are many tales of woe to tell upon arrival at the night controls.

SHOW WAR AVERTED

LESS than a week ago a show war seemed inevitable; today, however, the war clouds have passed away and the atmosphere has cleared materially. Chicago and the west were threatened with two shows, just as the east has had for a couple of years. The motor car industry, strong as it is, is in no condition to be mixed up in a fight over the matter of shows, which do not benefit the trade beyond bringing business directly and indirectly. It should be no part of the affairs of the trade at large to be dragged into a fight that happens to come up between promoters, whoever they may be. As a matter of fact the east is rapidly drifting away from being able to support so many big shows as it is now called upon to support, and certainly Chicago is in no better position in the matter. The trade may congratulate itself that a possible disastrous war has been averted.


HAIL - HAIL - THE GANG'S ALL HERE!
HOLLENDEN HOTEL
THE GANG IS HERE ALL RIGHT-!
THE GLIDDEN TOUR-
THE DAY BEFORE
WOMENS ENTRANCE TO HOTEL
SAY PIPE THAT ONE, HENRY-
LOVELY BUNCH OF SKIRTS
AW - SKIDOO!
PERFECT SCORE
GLIDDEN TOURIST
GRRR!
PENALIZATION
THE BUNCH ALL TRYING TO REGISTER AT ONCE-
SOMETHING DOING WHEN HE GETS LOOSE -!-!-
IT'S LITTLE WILLIE TO THE HAY - FIRST COME FIRST SERVE IN THE MORNING
(CLEVELAND)
NAPOLEON HOWER-
DAI LEWIS HANDING OUT BADGES.
MOTOR AGE-
LET ME TACK THIS ON THE PACKARD CAR

COEY WINS AT PEORIA

Thomas Flyer Driver Captures 6-Hour Race on Fourth—Mongini in Glide is Second

Peoria, Ill., July 4.—An impromptu race meet arranged by the United States Motor Racing Association after the St. Louis deal fell through was pulled off here today on the local mile track and the feature event, a 6-hour race, resulted in a victory for C. A. Coey of Chicago, who drove a Thomas Flyer to victory and rolled up a total of 269 miles, an average of 43 miles an hour. As usual the affair was a team race and attracted four entries—the Thomas, two Glides and a Maxwell. Mongini drove one of the Glides and Bald the other, while the Maxwell was handled by Charles W. Price, of Chicago, who made his debut as a track driver in this event.

Before the long race started there were several preliminary events contested, which were somewhat spoiled by several of the cars scratching. In the 10-mile race for stock cars listing under $2,500 Bald drove a model G Glide to victory in 14 minutes 56 seconds, with the Maxwell second. Coey captured the 5-mile open in the Thomas Flyer in 7 minutes 36 seconds, beating Mongini in a Glide. After that Coey went a 2-mile exhibition in the Thomas in 2 minutes 26 seconds.

The big race did not start until 4 o'clock in the afternoon which of course made the finish come at 10 o'clock. In consequence most of the racing was done by electric light. The track was frightfully dusty and it was impossible to remedy this evil because of difficulty in getting water for the sprinkling carts. Coey assumed the aggressive from the start and kicked up clouds of dust for the others to swallow. He started slowly but gradually increased his pace until in the fifth hour he had worked up to 49 miles and finished with 47. Bald gave him an argument for 25 miles until a leaky radiator compelled him to change cars. It had been planned that Bald and Mongini should have six-cylinder Glides but a slip at the last minute put Bold in a four-cylinder stock car, while the big Mongini was put in a four-cylinder Glide which had only come out of the shop on Wednesday and which was being tuned up. In these the two made a good showing. Coey changed from his roadster to his touring car at the end of the first hour and each hour after that he changed again.

Mongini was in the fight at the start and distinguished himself by twice killing his engine trying to get away from the tape. However, once under way he fought with Coey for some distance. Charley Price was in the 20-horsepower Maxwell touring car, fully equipped with top, etc., in which he went through the Chicago reliability run with a perfect score. He had driven to Peoria by road and he went through the race here without having to break the seals placed on the bonnet in Chicago. He made a splendid record at that. Green at track work, he plugged along at a 30-mile an hour clip and at the end he had accumulated 186 miles. Mongini was second to Coey with 231 miles and Bald third with 216. The statistical history of the race is as follows:

	1st	2d	3d	4th	5th	6th
Coey	42	42	44	45	49	47
Total	42	84	128	173	222	269
Mongini	36	33	35	40	43	44
Total	36	69	104	144	187	231
Bald	33	38	30	38	37	40
Total	33	71	101	139	176	216
Price	30	29	26	31	35	35
Total	30	59	85	116	141	186
Old record	41	83	124	160	198	238

It is claimed Coey smashed the Soules' record for 6-hour racing, being ahead every hour, his total of 269 miles being 49 miles better than the Soules' 238.

TAKE EDUCATIONAL TOUR

Minneapolis, Minn., July 7 —In the first road run of the season under the auspices of the Minnesota Automobile Association, from Minneapolis to Mankato, Minn., a distance of 84 miles, seventeen cars participated, and not one fell by the wayside. The start was made at 11 o'clock on the morning of July 6 and the return trip was made on Sunday, July 7. It was not termed an endurance test, neither was there any attempt at speed. The sole object of the journey was educational. It is the beginning of an active campaign for good roads in Minnesota, and the motorists believe that by taking such trips they will come in close contact with the very persons who ought to be most interested in highway improvement, and that sentiment in favor of such improvement will thus be created. The next run is to be made to Duluth early in August. Arriving at Mankato, the association members held a business meeting. Good roads, signs, road maps, legislation and races at the Minnesota state fair in September were topics considered. It was voted to hang up $5,000 in prizes for the races which are to be held on the closing day of the fair.

MORA FINISHES RUN

New York, July 5—The Mora racytype, which competed in the A. C. A. sealed bonnet contest, journeyed to Chicago and was a contestant in the Windy City test, reached this city last night, having covered 3,219 miles without breaking the original seals on the bonnet, transmission, coil, battery, and tool box. In all this time it is claimed that there was no repair to the car beyond changing the front wheels and tires before starting home from Chicago. The car was piloted in both the club contests by W. H. Birdsall and from the factory at Newark, N. Y., to Chicago and return by J. H. Stickney and J. H. David. F. Cimiotti, the New York agent of the Mora, drove it to and from Newark at this end of the line.

NEW MARK BY JACKSON

Record of 833 Miles in 24 Hours Made in Single-Car Race Run at St. Louis on the Fourth

St. Louis, Mo., July 6—The Jackson 50-horsepower car, driven by Burman and Claps, won the 24-hour Fourth of July endurance contest, covering a distance of 833 miles. This is claimed to be a world's record for a single car 24-hour race. Of seven entries only the Jackson and Matheson finished. The Matheson, driven by R. E. Smith, made 752 miles. The other cars entered in the race and their drivers were: 30-horsepower Cadillac, driven by Graham; 50-horsepower Haynes, driven by L. A. Wagner and F. Woodward; 30-60 horsepower Stearns, driven by Alvin and Grinham; 35-horsepower Oldsmobile, driven by Corkhill and W. Bagnell, and the 34-horsepower Elmore, driven by O'Neill and Lohse.

The race was held on the circular track at the old St. Louis fair grounds under the auspices of the recently organized St. Louis Automobile Manufacturers' and Dealers' Association. The race began at 10:30 p. m. July 3.

The Cadillac took the lead in the first hour, reeling off 42 miles, while the Jackson and Haynes, with records of 39 miles, were its nearest competitors. The Cadillac set the pace until 2:30 a. m., when with a lead of 10 miles over its competitors, it ran into the fence and was completely wrecked. Henry Suttkuss the relief driver who was operating the car at the time of the accident, escaped without injury, but Henry Glamann, his mechanic, was struck by a board which pierced the radiator of the machine and broke his leg. The accident occurred on the north side of the track, while the Cadillac was running close in to the fence at a speed of 45 miles an hour.

The Haynes then took the lead and held it until the passing of the eleventh hour. During 12 hours of continuous running the Haynes made a record of 39 miles an hour. After this the car met with serious mishaps, was laid up for repairs several hours, but held out until the end of the twenty-second hour, having covered a distance of 642 miles. From the fifteenth to the twenty-second hour the Haynes car kept up a merry pace, circling the track with hardly a stop during the time. Ignition troubles and the stripping of a gear finally resulted in the retirement of the car from the race. A broken crankshaft caused the Stearns car to retire in the sixth hour with a record of 195 miles. The Oldsmobile next fell by the wayside. The car went through the fence on the back stretch of the track and was so badly wrecked that it could not continue. In the 9 hours that the car was on the track it made a distance of 306 miles, being at the time 43 miles behind the Haynes.

The Elmore dropped out of the race at the end of the eighteenth hour, with a record of 502 miles. This left only the Jackson, Haynes and Matheson in the race. The Jackson had a lead of 45 miles over the Matheson and 98 miles over the Haynes and was never again in danger of losing the race. During the last hours the Haynes was in the race its drivers made a desperate effort to regain lost ground, but constantly recurring ignition troubles retarded its progress.

Preceding the 24-hour contest a card of six races was run during the afternoon of July 3. There were two entries, a Cadillac and Reo in the first race of five miles for cars listing under $2,000. The Reo dropped out before the first mile was finished and the Cadillac had the track to itself, finishing in 7 minutes 34 1-5 seconds.

The second 5-mile race was for touring cars listing under $3,000. The entries were a Wayne, driven by C. Corkhill, a Corbin, driven by A. B. Cull and a Jackson by Robert Burman. The Jackson won by three-quarters of a mile, with the Corbin second and the Wayne third. In the 10-mile race for cars listing under $3,000 the Thomas, driven by H. A. Robinson, defeated the Wayne, driven by Will Smythe. Time, 13 minutes 28 seconds.

A 20-mile race for runabouts listing $3,000 and over was won by Fred Grinham in a Packard in 23 minutes 32 seconds. Two Moons, a Stearns and American were the competitors. The American finished 2 minutes behind the Packard. An exhibition contest between the Franklin, Packard, Jackson and Thomas was won by the Packard, Fred Grinham driving. The Thomas finished second. Time for the 10 miles, 11 minutes 59 seconds.

Five cars started, but only one finished in the 50-mile race. The factors in the race were a Thomas Flyer, driven by Grinham, an Oldsmobile by Corkhill, and an American by Davis. At the finish of the twenty-fifth mile the Thomas had a lead over the American of 3 miles, but ten laps further on broke down and retired. The American finished the race in 1 hour 10 minutes 25 seconds.

MEET ON BROOKLANDS TRACK

New York, July 6—The cable tells of the first race meet on the new Brooklands track at Weybridge, England, today. This is the 3¼-mile oval on which Edge established his wonderful 24-hour record. Today, however, was the first time any real racing was done on it. Every effort was made to imitate the horsemen, and the drivers of the cars sported silk as do the jockeys. Half a dozen stake events were run off, the feature being the Montague cup, valued at $9,500, in addition to a $1,000 trophy which was won by J. E. Hutton. The cable says Hutton drove a German car but as he has been handling a Berliet in the beach races in England it is presumed by the New York critics that he also drove it at Brooklands.

TO BE IN N.A.A.M. SHOW

Independents Decide Not to Promote a Second Exhibition in Chicago This Winter

New York, July 8—There will be no formal withdrawal of the independents from the N. A. A. M. Chicago show in the Coliseum and armory this year. This was the decision reached at a meeting of the special show committee—Benjamin Briscoe, William M. Lewis and Alfred Reeves. "The building we had in mind," said General Manager Reeves today, "was the stockyards exposition hall, which we could have had at practically a nominal rental. A majority of our members was against participating in the show and in fact against any show but the one in New York. Personally, however, I am a great believer in shows in New York, in Chicago and in all the cities. It was the opinion of our committee that present trade conditions did not warrant any such experiment as an independent show or any venture at the stockyards in an untried building and locality this year at least, so we decided to let matters stand as they are."

The following is the official statement of the A. M. C. M. A. announcing the decision of its committee:

"Although the American Motor Car Manufacturers' Association did not receive the recognition which it considered fair to its members in exhibiting at the Chicago show, the committee having the matter in charge, felt that rather than disturb the trade conditions at the present time, by making a move which might not be beneficial to the industry, the present conditions should be supported. Besides there was a decided lack of interest on the part of manufacturers in connection with the Chicago show, only twenty-three out of forty-five members of the American association taking space. Big manufacturers like Ford, Buick, Pennsylvania, and the American Mors, did not apply.

"Moreover, the goddess of chance seemed to favor American association members in the drawing, for with few exceptions they all secured excellent space. This, combined with the feeling that an independent show at Chicago this year might not be best for the motor trade as a whole, has resulted in the announcement that the A. M. C. M. A. would work in harmony with the N. A. A. M. in the promotion of the affair in Chicago this December.

"Working with the Chicago Automobile Club arrangements for an independent show in Chicago for 1908 are now under way."

The announcement by the American Motor Car Manufacturers' Association that it does not intend to put on a second show at Chicago pleased the New York trade as a whole and it is believed the feeling is the same throughout the country. It is argued that the condition of the trade at the present time does not demand two shows in Chicago; that the N. A. A. M. efforts in the past in the Windy City have been successful affairs and that it looks as if the show next winter will be fully as successful as its predecessors. Besides it is held that going to the stockyards for a building is rather a risky experiment. The independents, though, have not given up the idea altogether and it is believed they will look ahead a year and with the coöperation of the Chicago Automobile Club it may be possible to stage such an exhibition as the A. M. C. M. A. has in mind.

RESULTS AT LOWELL

Lowell, Mass., July 5—A. E. Morrison, the Boston representative of the Oldsmobile and Stearns cars, received a fracture of the left leg, and many bruises, and Charles Johnson, a Boston newspaper man, was bruised and cut as a result of the Stearns car Morrison was driving in a race meet here yesterday going up a bank and turning over. It was either kill a small boy who stood directly in the path of the onrushing car, a big Stearns, going 50 miles an hour, or take a chance of swerving out of the course. The races were held on the speedway over the state highway, which is a 5-mile stretch, and the cars in each event were started a minute apart. There are some dangerous curves and it was due to this that the accident occurred. Fred Marriott drove his steamer an exhibition mile in 45¼ seconds. The best time of the day for a touring car was made by the Stevens-Duryea, which covered 5 miles in 5 minutes. The car was then sent for the touring car record for 1 mile carrying seven passengers and it broke the old record, doing the distance in 51 seconds. The other events of the afternoon resulted as follows:

Five miles, gasoline cars, 24 horsepower and under, standing start—H. Wilson, Corbin, won. Time, 6:28. Three other cars started but did not finish.

Five miles, gasoline cars, 25 horsepower or over, standing start—J. Hancock, Stevens-Duryea, won; H. Wilson, Corbin, second. Time, 5:00.

Five miles, roadsters, standing start—W. A. Frederics, American, won; L. W. Butler, Pierce-Racine, second; J. Hayes, Dolson, third; J. Matson, Corbin, fourth. Time, 5:10.

One mile straightaway, flying start, free-for-all—P. J. Robinson, Stevens-Duryea, won; J. Matson, Corbin, second; H. Lighthall, Welch, third; Allen, Stearns, fourth. Time, :45.

WILL OIL ROADS

St. Louis, Mo., July 8—The Automobile Club of St. Louis is coöperating with the Log Cabin and Country clubs in St. Louis county to sprinkle the country roads around St. Louis with oil. A subscription of more than $1,200 has been made up for the purpose of defraying the expense of oiling the roads. Four miles of the Clayton road, the most traveled thoroughfare between St. Louis and Clayton, the county seat of St. Louis county, have been oiled, and the results have been most satisfactory to the Missouri motorists.

SOME TRENDS of MODERN AUTOMOBILE DESIGN*

By Victor Lougheed

PART III

COOLING SYSTEMS PRESENT AND PROSPECTIVE

MOTOR CAR engine cylinders are cooled for four principal reasons—to prevent warping and breakdown of the cylinder metal, to minimize the combustion of the lubricating oil used to separate cylinder and piston, to avoid preignition of the fuel, and to do away with the heating and consequent premature expansion of the incoming charges. The question of air cooling or water cooling is altogether one of comparative results—of balancing advantage against advantage and disadvantage against disadvantage. If air cooling can be made the better in every respect, no one will be found to decry it. It is a fact that even today many designers of water-cooled cars believe that air cooling will become the system of the future, though they do not believe in the expediency of adopting it in its present stage of development.

It is the contention of this series of articles that, by the use of pump systems of fuel feeding in connection with minor modifications of cycles and constructions, the necessity for cooling can be largely done away with, and what little there remains necessary effected more simply and effectively than by the methods now in vogue. To recur, in this connection, to the ideas expressed in the first paragraph of this article, the warping and breakdown of the cylinder metal is much less likely to occur than is commonly imagined. Warping is much more a symptom of irregular casting and of bad design than it is of undue overheating, and it is a fact that castiron is stronger at a temperature of about 500 degrees Fahrenheit than it is at any other, while it loses very little in strength even when heated to the extent of a dull redness.

The question of lubricating-oil combustion and carbonization is, of course, the serious one, but even this condition can be helped by rigid adherence to the mineral oils proved best for the purpose, and it offers every hope of solution by methods to be suggested hereinafter. Preignition can be disposed of finally and completely by the means explained in the preceding article of this series. And the objectionable heating of the incoming charge, which reduces charge weight by reducing the amount that can be drawn into the cylinder, is a matter that the writer will show can be easily corrected.

There is much that certainly is somewhat absurd in the whole present status of engine temperatures. In steam engineering one of the greatest problems is to keep the engine warm enough, to which end the cylinders and steam pipes are swaddled in all manner of asbestos, wood, and other laggings to prevent the heat losses that are known to detract so seriously from efficiency. In gas engineering the other extreme exists, the corresponding problem being one of keeping the cylinders cool, and it is the custom to pump and pour water over them, to fan them violently with air, etc., to carry the heat away fast enough to prevent general inoperativeness. Indeed, it is a matter of record that in some of the earliest experiments of the great foreign motor engineers ice was used to pack the cylinders, so misunderstood was the problem. And many a layman even today supposes that the thing to be done is to keep the cylinders as cool as is possible—instead of as hot as is permissible up to a point of safety.

Why is it not probable that the perfected engine of the future, which in all likelihood is to be an internal-combustion engine, will not require either warming or cooling of any form?

Simplifying the Cooling Problem

There appears to be much possible in the way of simplification of the cooling problem, preliminary to its effective solution, once the matter is thoroughly investigated. Dugald Clerk, the originator of the two-cycle principle, and by many regarded as the foremost authority on internal-combustion engines, has shown by means of a single-cylinder, Otto-cycle experimental engine of 300 horsepower that mean-effective-pressures of over 100 pounds to the square inch—double those secured in motor car engines—can be had with producer gas—a poor fuel—with the very desirable feature of dropping the maximum flame temperature fully 900 degrees Fahrenheit—from 3,000 degrees Fahrenheit to 2,100 degrees Fahrenheit. The engine in question was arranged for air scavenging and "supercompression," and it was found necessary to use the water-cooled piston and exhaust valve commonly provided in large gas engines of this type to prevent preignition. Similar results are secured in the large Premier stationary engines, provided with differential pistons for air scavenging.

Another possibility in the direction of cooler working is found in methods of expanding the charges to lower terminal pressures before exhausting. The Atkinson engine, which at the expense of much crank-and-connecting-rod complications, possesses a working stroke twice as long as its suction stroke, and the Sargent engine, which inspires fuel during only the first half of the suction stroke, both exhaust with terminal temperatures as low as 400 degrees Fahrenheit and terminal pressures so low as to require no muffling. Further improvement is to be had if the expansion can be made more rapid, reducing the time during which the inflamed charges are in contact with the walls.

EDITOR'S NOTE—This is the third of a series of articles on "Some Trends of Modern Automobile Construction" by Victor Lougheed; the fourth article will appear shortly.

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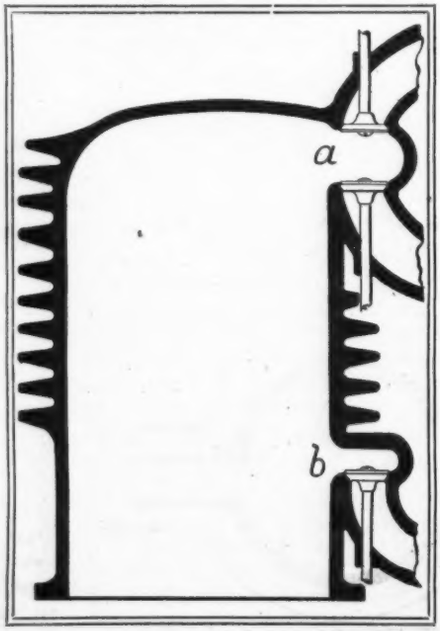


FIGURE 13—FRANKLIN CYLINDER

Elimination of the considerable amounts of hot exhaust gases, which, subsequent to the exhaust strokes, always remain trapped in the clearance spaces of motor car engines of approved types, will reduce the amount of cooling required.

Stratification of the charges, so that the combustion-chamber walls are shielded from the burning gases by layers or strata of pure air or of inert gases, is an attractive prospect, not only because of its relation to cooling but also because of its relation to efficiency. This principle was regarded as very important by the great Otto, who placed much stress upon it in his patent claims.

The distribution of the heating effect within the cylinder is another matter well worthy of study. The now-recognized fact that it pays to avoid projecting points and corners within the cylinder head is an illustration of this, but better cases in point are those in which efforts are made to prevent the passage of extremely hot gases through the exhaust valve, which, in the average engine, is the element that occasions the most trouble from overheating. An example is the auxiliary exhaust, uncovered by the piston at the bottom of its stroke, and through which most of the hot gases escape, thereby greatly relieving the regular exhaust valve. This type of auxiliary exhaust, as applied to the very successful Franklin motor car engines, is sketched in figure 13, in which A is the regular exhaust valve and B the auxiliary exhaust valve.

Enough has been said to outline certain obvious means of simplifying the cooling problem materially. The rest of this article will be devoted to a consideration of the advantages and disadvantages of various systems of air and of water cooling, accompanied by an analysis of the conditions that afford the most encouraging prospects of progress to something better than anything now in general use.

Cooling by Means of Water

Water cooling is at present the most used system because it affords practical results with a degree of reliability that few manufacturers or users of motor cars will admit has been attained with air cooling. At the same time, as has been pointed out, it possesses numerous inherent objections, and its retention is generally regarded as a mere necessity.

Expense and complication are inevitable features in any apparatus that performs a variety of functions, such as are performed by the different elements of a water-cooling system. Could these be avoided, reliability would be increased, maintenance simplified, and first cost reduced. Radiator, piping, expensive and complex cylinder constructions, etc., all are entailed by water cooling, and the fan and the circulating pump are found in most cases to be additional necessities. A good radiator cannot be had for little money, pumps are expensive if good, fans cost

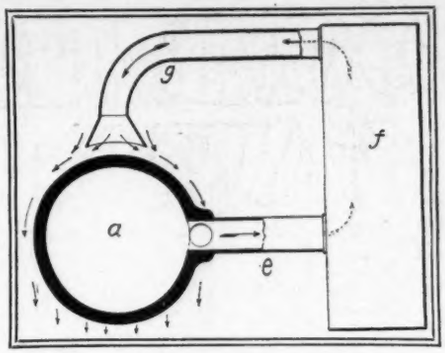


FIGURE 14—EXHAUST-FORCED COOLING

something to assemble and install, and the provision of waterjackets very much complicates the cylinder castings, or necessitates the use of attached jackets, sure to be either expensive or of doubtful durability. Undoubtedly there are more faulty cylinders because of the effort to cast them with waterjackets than because of any other one reason.

Weight is unavoidably considerable in any system of water cooling because of the same conditions that make for complication. Could water cooling be dispensed with, without replacing it with an air-cooling system equally heavy, motor cars would be relieved of just so much dead load, resulting in increased carrying capacity, reduced operating expenses, and lessened power requirement. Few radiators for a 30 or 40-horsepower car will weigh less than 100 pounds empty. Filled with water they will weigh from 10 to 30 pounds more.

Undue efficiency is, singular though this reason may sound to motorists who have been troubled with overheating of motors, an objection to water cooling. This is because there is a certain disadvantage in effecting the cooling by waterjacketing, in that the water leaves the cylinders at about 180 degrees Fahrenheit whereas the burning gases have a temperature usually ranging from 3,000 degrees Fahrenheit to 1,400 degrees Fahrenheit, and are rarely as low as 2,100 Fahrenheit to 400 degrees Fahrenheit—the probable minimum that can be attained. This marked temperature difference means an enormous transfer of useful heat to the waterjacket, more heat always being lost in this way than is accounted for in work done by the engine.

With air cooling, on the other hand, in

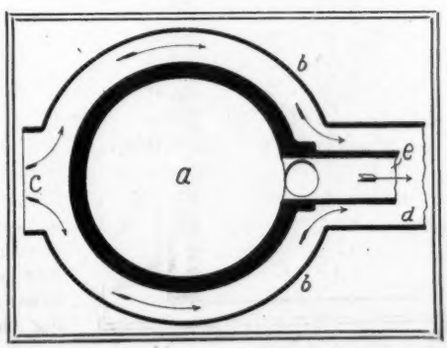


FIGURE 15—EXHAUST-INDUCED COOLING

which the wall temperatures of the combustion chambers are rarely lower than 400 degrees Fahrenheit or 500 degrees Fahrenheit—against the 180 degrees Fahrenheit of water cooling—better fuel economies are secured, as has been proved in many motor car economy tests. This is because, the temperature difference not being so marked, the heat transfer is reduced proportionately. But it must not be forgotten that with ordinary air cooling other objections may supervene.

Unreliable and delicate are rather harsh words to apply to cooling systems that are in wide and comparatively successful use, but it has to be admitted that the presence of water cooling renders a car subject to trouble from leaks, drying out, and freezing.

Some water-cooling systems are more reliable than others, and good construction and sensible operation unquestionably reduce vastly the chances of breakdown, but even with every possible precaution taken there is no doubt that in the average user's hands a car fitted with water cooling is subject to the chances of leaks, of drying out, and of freezing in cold weather. If leaks do not occur as a result of corrosion or vibration, they may occur from accident or ill-advised tinkering; and, if a suitable anti-freezing mixture is not used in cold weather, serious damage may be done to the cylinders and to the whole power plant despite any safeguard that it is in the power of the manufacturer to provide.

Air Cooling of Combustion Motors

Air cooling is making increasing inroads upon the popularity of water cooling, and is proving a thorough success on large numbers of very practical cars. At the same time it has not yet satisfied a majority of manufacturers and buyers of its applicability to all classes of cars—and especially to engines with large cylinders. This, the writer contends, is because air cooling still is in need of considerable improvement, in which case the signal successes already achieved even with imperfect systems of air cooling only go to prove the promise of the system as a possible final form.

Low cost and simplicity are in at least some degree characteristic of all air-cooling systems, though further simplifications and cost reduction would be desirable. In its simplest practical form air cooling requires nothing more than flanging or ribbing the external cylinder surfaces so as to increase the areas exposed to the air, applied in connection with some means of insuring air drafts over the cooling surfaces. With motor cycle and other small engines, the natural draft occasioned by the progress of the vehicle is found sufficient, but even when fans are provided the system still remains simpler than the simplest water cooling.

Efficiency of air cooling is due to the reduction of heat losses to the cylinder

walls, as has been explained. And the fact that in some present-day systems the cooling is accomplished so inefficiently by the air itself as to throw much of the work of cooling upon the lubricating oil, is a point against a few contemporary constructions rather than against a general principle.

Light weight of air-cooling systems is a natural result of their simplicity. In some cases the saving in weight may not be very considerable, and in others it is kept from being apparent by additions to the weights of other parts of a vehicle, but under the most favorable conditions the reduction even now is as much as 200 pounds in the case of some large cars.

The ejector action of the exhaust is a principle of considerable interest for producing the necessary air circulation, thus doing absolutely away with dependence upon the fan, which may break down, or upon the movement of the car, which is insufficient at low speeds with heavy pulling. This system appears in two chief forms—the first, that sketched in figure 14; the second, that sketched in figure 15. In figure 14, A is the cylinder, E is the exhaust, F is the muffler, and G is the muffler vent, directed upon the cylinder A. The blast of gases from G draws a considerable volume of the adjacent air with it, and the combined stream flows over the cylinder with a considerable cooling effect. This form has been used with much success with the Orient buckboard engines, though it possesses the objection that the cooling effect is lowered—in less degree than would be imagined, however—by the admixture of hot gases in the cooling currents. Because of this objection, the form sketched in figure 15 has been suggested. In figure 15 A is the cylinder, bb is a housing partially surrounding it but open at c and d, and e is the exhaust. The exhaust issues from e in the direction indicated by the straight arrow, inducing a flow of air from c to d, as indicated by the curved arrows. It will be noted that with this design none of the exhaust passes over the cylinder.

With this principle of utilizing the ejector action of the exhaust an air-cooling system becomes self-contained, without mechanical elements that may break down.

Any objection to this system of producing the circulation on the ground that the induced air currents will not be of sufficient volume or force is pretty well answered in the construction of a Bunsen burner, in which proportionately great volumes of air are given a powerful flow by the inducing action of heated columns, which ascend with a force hardly exceeding small fractions of an ounce.

Cooling by area of surfaces and by quantity of air are the two distinct principles at present employed in air cooling. By the first of these are meant the various plans of increasing the area of the cylinder surfaces, as by the use of pins, combs, flanges, ribs, etc., over which moderate

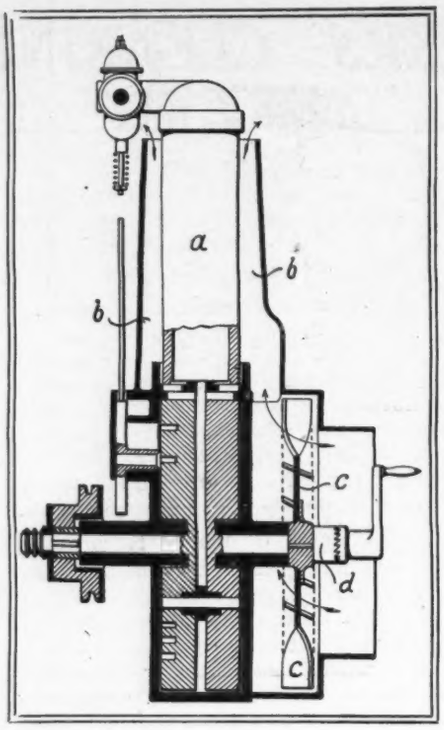


FIGURE 16—DAIMLER AIR-JACKETED MOTOR

currents of air are caused to flow by one method or another. By the second is meant the system of air jacketing, used on the very first liquid-fuel engine made by Daimler, and since developed in the Frayer-Miller cars. The principle of this system is very apparent from figure 16, which depicts the early Daimler engine, and in which a is the cylinder, b the air jacket, and c a blower fan mounted on the crankshaft d, so that it draws the air through the jacket in the direction indicated by the arrows. The cooling effect is gained, not by the area of the surfaces exposed to the air, but by the quantity of air forced over the surfaces.

There is very little radiation involved

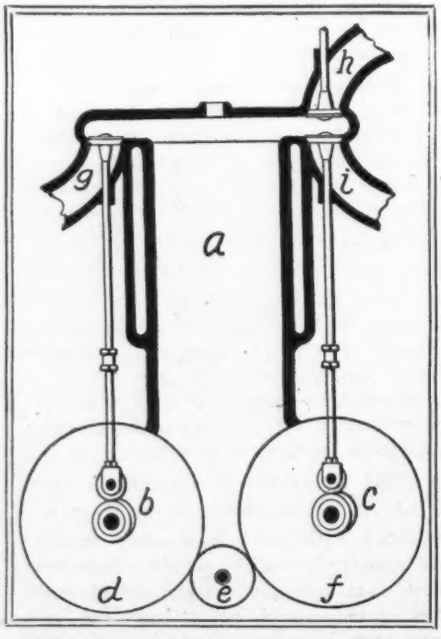


FIGURE 17—GORET SIX-CYCLE MOTOR

in the air cooling of an engine cylinder, the heat being removed almost wholly by convection—by an actual picking up of the heat units during momentary contact between the rapidly moving particles of air and the heated surfaces. And, since a given quantity of air can absorb just so many heat units, it follows that the greater the quantity of air that can be handled in a given time the more the heat disposed of.

Cooling by scavenging is in every way the most encouraging method in sight, in so far as the possibilities of real improvement are concerned. If, in the operation of a liquid-fuel engine, air can be caused to flow through the interior of the cylinder during certain portions of the cycle, it must follow that there will be an internal cooling effect, just as there always is some reduction of temperature each time a fresh, cool charge enters the cylinder. And if this interior cooling effect can be made sufficiently pronounced, it will greatly reduce or perhaps eliminate all necessity for external cooling, the more so inasmuch as it directs the cooling where it is most needed—against the lubricated surfaces that suffer most from heat.

Such internal cooling has been obtained in small degree in the Torbensen engine, in which the cool incoming charges are caused to sweep over the hot exhaust valve. Something of the same sort also is done in the engines of the English Lanchester cars, which have only one common exhaust-and-inlet-valve to each cylinder, the alteration in the flow of gases being secured by an external shutter. But the first engine of which the writer knows, in which large volumes of pure air were definitely handled as a means of cooling, is the Goret six-cycle, experimented with in France a number of years ago. This engine is illustrated in figure 17, in which a is the cylinder, bc are the camshafts, def are three-to-one gears, g is the exhaust valve, h is the inlet valve, and i is an air valve. The engine operates like the usual four-cycle, except that after the exhaust stroke is completed the valve i is held open during a complete revolution of the mainshaft, so that a cylinderful of pure air is inspired and expelled before the suction stroke commences. The engine worked as cool as is desirable, but the fact that only one stroke in every six was a power stroke prevented the securing of even torque without an almost-prohibitive cylinder multiplication.

However, it unfortunately does not appear to be necessary to work in the direction of such freaks as six-cycle engines to secure effective internal cooling and scavenging.

In the next article of this series there will be described some absolutely-new two-cycle and four-cycle engines, in which scavenging with internal air volumes is depended upon as the sole means of cooling—not to mention incidental features and advantages of extraordinary import.

THE READERS' CLEARING HOUSE

CLOGGED WATER SYSTEM

Hillsboro, Wis.—Editor Motor Age—Some time ago my single-cylinder Packard model F sprung a leak in the water system, to stop which we were told to put some cornmeal in the water tank. This stopped the leak and the engine worked fine, but in the course of a week or so the cornmeal clogged the pipes and the water now fails to circulate. The engine becomes heated if we run a mile. The pump is all right. The water gets to the engine all right but fails to circulate.—Dr. F. A. Ferriter.

Take off the pump and give it a thorough cleaning. Before putting it in place again attach a hose to the pipe leading to the cylinders and force water through to remove anything that may have lodged. Treat the radiator the same way, but be careful not to use so much pressure as to damage the tubes. This ought to remove the trouble.

OVERHEATING WATER

Louisville, Ky.—Editor Motor Age—I have a two-cylinder Rambler and have been troubled lately by the water in my engine becoming too hot. This is usually caused by the improper circulation of the water, but such is not the case with my engine. Please explain the cause of this in the Readers' Clearing House columns in the next issue and let me know how to overcome the difficulty.—J. A. Eddie.

Probably the spark occurs too late, the carbureter needle valve may be in need of adjustment or the waterjackets of the cylinders and the inside of the radiator may be coated so as to prevent the heat from reaching the water. There are many causes for heating, but these are the usual conditions that cause trouble.

GRAPHITE LUBRICATION

Saginaw, Mich.—Editor Motor Age—Although the excellence of graphite for all sorts of lubrication and its particular adaptability to certain difficult lubrication is a matter with which most of us are familiar, few, perhaps, are cognizant of the fact that there are two forms of graphite—flake, or foliated, and amorphous, or nonstructural, graphite—and that though chemically the same the latter is capable of finer pulverization and with careful treatment may be reduced to an impalpably fine powder absolutely free from grit or any sort of harmful impurity. Flake graphite, on the other hand, no matter how finely pulverized, always retains its original mica-like or crystalline structure and, comparing one with the other, there is a vast difference in nature, texture, action and effect. Amorphous graphite is adhesive in the highest degree. It stays put, and adhesiveness is one of the first requisites of an efficient lubricant in that to cool a hot bearing it is absolutely essential that the lubricating agent "stay put" where applied. To illustrate: Take a pinch of finely pulverized amorphous graphite and rub it in the palm of the hand, on paper or on some other convenient surface and observe its action. Note that the more one rubs the more effective the lubrication, for this form of graphite is not easily removed from surfaces in frictional contact but maintains constant and effective duty right at the point of contact and is at its best under heavy frictional pressure, in that, as above stated, it is adhesive in the highest degree—"stays put"—and there is absolutely no waste, as every particle is an active lubricating factor. Then, too, as an impalpable powder it readily and quickly penetrates and distributes itself in a smooth, slippery, even coating between the tightest bearings, filling every pore, crevice and interstice, thereby evening irregular bearing surfaces and reducing friction to a minimum. Let us also see how, mixed with lubricating oils, this amorphous graphite will minimize friction. A microscopic examination of perfectly smooth bearings—cylinder surfaces, for instance—will disclose many minute irregularities, which in the nature of things must be productive of more or less friction. This friction of course means wasted energy—energy that instead of being utilized as power is absorbed as heat—a condition that more often than not means an overheated bearing with the consequent loss of time and temper. To effectively overcome this friction and utilize this otherwise wasted power a lubricant possessing considerable body is required—that is, a substantial lubricant of such a nature as to eliminate as far as possible these microscopical irregularities and provide a bearing offering minimum resistance to the surfaces in play. Experience, which is man's teacher, has not only demonstrated time and again that oil in itself will accomplish this only to a certain extent but it has also taught that pure soft finely powdered graphite, properly and judiciously applied, will do wonders, so it only remains to make the proper application of the right sort of graphite. It has, therefore, long been the endeavor of intelligent engineers to secure a graphited oil, that is to say, an oil in which graphite floats or is held in suspension without precipitation sufficiently long to perform its duty, for it is easy to see the great advantage to be derived from the use of an oil having every drop impregnated with solid lubricating matter. This seemingly simple problem, however, is one that has until lately baffled engineers of experience, but it has now been found that amorphous graphite when reduced to an impalpably fine powder will, when mixed with oil in the proportion of about one teaspoonful to a pint of oil, remain in perfect suspension long enough to feed through lubricator tubes without clogging, thus causing every drop of oil to carry its mite of graphite.—United States Graphite Co.

TIMER OR CARBURETER

New York, N. Y.—Editor Motor Age—I am running a one-cylinder Reo runabout, this being the second year it has been in use. Occasionally I have trouble in starting the engine, although after starting it runs all right. Sometimes it will spark and start off nicely on the first turn of the crank, but at other times it does not seem to fire until just after compression takes place, and the explosion, if any, is too feeble to carry the stroke through to the next contact unless I keep turning hard on the crank. The spark is strong, and I think the trouble either must be in the carbureter or else in the valves or piston rings. Can you inform me through your columns which it is most likely to be? I have run kerosene through the cylinder several times, but it does not seem to remove the trouble.—Subscriber.

Make a careful examination of the timer; indications point to the fact that it has slipped. The rings must be all right, else the motor would not run satisfactorily occasionally. If the timer is all right, then the trouble would seem to be in the adjustment of the carbureter.

CASE OF GRAFT

Coatesville, Pa.—Editor Motor Age—I enclose a copy of a letter received by me this morning, which will explain itself. I thought probably you would like to publish this letter in Motor Age, as it is purely a mater of graft. The letter is as follows:

F. W. Speakman, Coatesville, Pa.—Complaint has been duly made before me charging you with violating the act of 1905 in relation to automobiles, in that you on June 25, 1907, gave no warning of your approach at cross roads, by blowing the horn, while operating your motor vehicle on the public roads in Williston township, Chester county, Pennsylvania. A warrant has been issued to constable of said township for your arrest on said charge. If you desire to avoid arrest under the said warrant, and the costs and expenses incident thereto, you will appear before me at my office in Willistown township, ½ mile north of Sugartown, on the road leading from Malvern to Sugartown, on Thursday, July 11, 1907, at 1 o'clock p. m. If you fail to appear at said time and place the officer will be directed to execute the warrant and you will be arrested and brought before me in accordance therewith. —Charles E. Coxe, Justice of the Peace.

I understand there have been a number of arrests made in that section of the county on similar charges, and the alleged offenders have paid rather than go to court. However, they have been carrying the matter on in such a high-handed manner and have arrested so many motorists we have decided to appeal to the courts for justice.—F. W. Speakman.

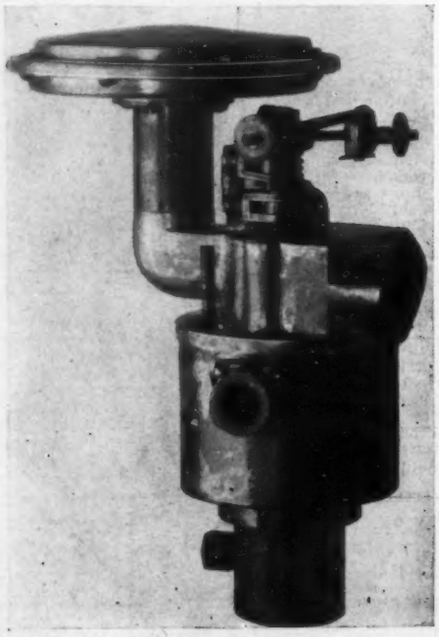
MOTOR CAR DEVELOPMENT

Chadwick Six

CHADWICK SIX CHAIN HOUSING

CHAIN HOUSING SHOWING STRUT ROD

ALTHOUGH the six-cylinder invasion has not stormed the American market so strenuously during the present season as it has the European field, the crop of "sixes" is sufficiently large to warrant the prediction that a large percentage of American builders will count six-cylinder models among their 1908 outputs. Not the least important of the six-cylinder cars of the past spring was the Chadwick, built by the Chadwick Engineering Works, Philadelphia, Pa., which concern is the successor to the Fairmount Engineering Works of the same place. The Chadwick six deserves attention in that it differs in several details from many prevalent conceptions in motor car engineering, but coincides with popular ideas in others. The harmony with present-day practice appears in the general use of D. W. F. or Hess-Bright ball bearings carrying the road wheels, gearset and jackshaft; the indulgence in the double system of ignition with magneto and battery as the current sources; using chrome-nickel steel for frame, axles, transmission and motor parts, save those places where high carbon machine steel has been deemed more desirable by the designer, and lubrication by a many-feed mechanical oiler, assisted by crankcase splash. But while the drawn curtain discloses these accepted constructions, an introduction is necessary to a few of the unconventionalities of the car, foremost among which come the aluminum housings for carrying the driving chains. Each chaincase consists of two half-shells, one inclosing the top half of the sprockets and chain and the other caring for the lower half. The outside face of each housing has two circular openings for giving access to the sprockets. These openings are provided with cast-aluminum cover plates. The inside face of each chain casing is shaped to fit the strut rod. The countershaft moves in the strut rod when adjusting the chain, so the chaincase does not have to be telescopic. The two cases complete weigh 6 pounds and are easy to remove. Another feature, yet one not new with Chadwick cars, is the use of a circular copper waterjacket for inclosing each pair of cylinder castings. Making each jacket circular gives good cooling facilities and yet does not increase the water capacity beyond the 6-gallon limit. The third innovation is the use of a cone clutch in the flywheel and facing the aluminum male portion with sheets of phosphor bronze, riveted in place and turned off. Inserted in this bronze are sixty ¾-inch cork inserts, for the purpose of easing engagement. Fourth in the category of unconventionalities is the Chadwick semi-selective gearset, in which the rear end of the countershaft carries a bevel gear, as does the rear end of the mainshaft, these bevels being constantly in mesh with a double bevel on the differential gear.

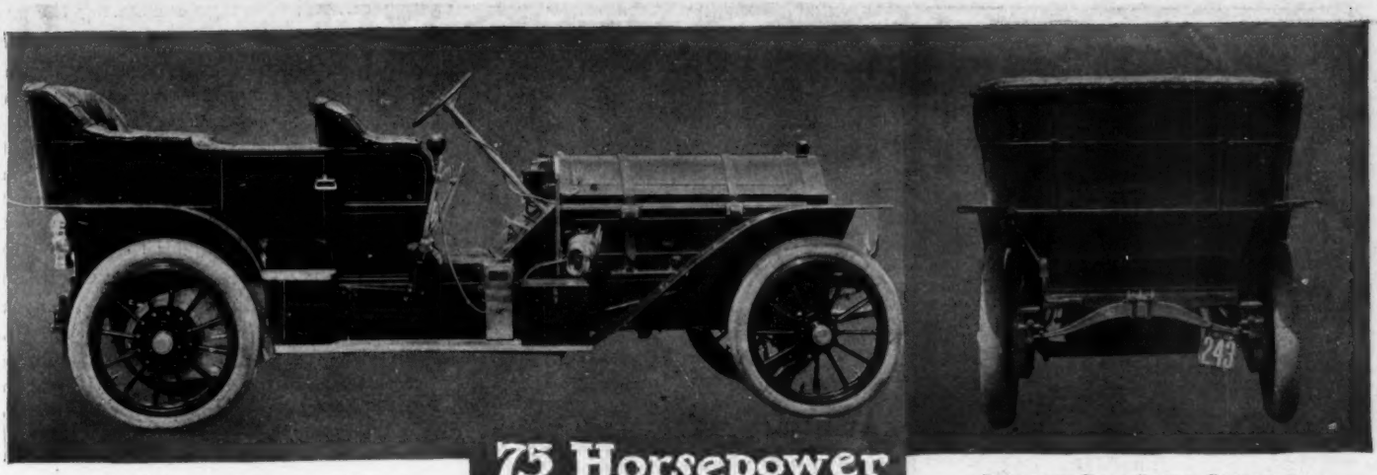


CHADWICK'S IMPROVED CARBURETER

The Chadwick six, or, as its maker terms it, the Great Six, with its cylinders 5 inches in diameter and designed for a 6-inch stroke, should show 70 to 75 horsepower at a crankshaft speed of 1,100 revolutions per minute. Taken in conjunction with its gear ratio of 1 9/10 to 1 on the fourth or high speed this should make a mile a minute easy traveling. As if to equip the car for service of this nature a 124-inch wheelbase has been deemed sufficient; the tread measures 56 inches; front wheels, 34 inches in diameter, are shod with 4-inch tires, and rear wheels, 36 inches in diameter, are provided with 5-inch tires. In spite of its cylinder capacity, its wheelbase, its carrying accommodation and other details consequent upon six-cylinder construction, the Chadwick six is listed to weigh 3,000 pounds with its complete equipment.

Like a big building, a big car needs a good foundation, and for this the maker has selected chrome-nickel steel as the burden-bearer, this constituting the side and cross members of the frame. The former members, of channel section, are made with a maximum vertical depth of 4½ inches and with lips 1¾ inches wide where the frame is offset at the dash and 1½ inches wide at the other points. In supporting the motor and gearbox on this framework a sub-frame is not required, the motor arms spanning the 29½-inch space which separates the frame pieces at the front, while the 36-inch gap between the side members at the rear is bridged by a pair of channel members, to which the transmission case is attached by four suspension bolts. A truss rod supports each side member between the axles. Carrying the framework on the car axles is a set of

CONTROL PARTS ON CHADWICK SIX



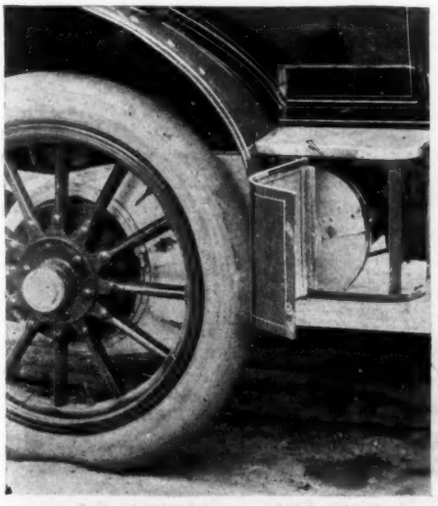
SIDE VIEW OF CHADWICK SIX

CHADWICK REAR SPRING SUSPENSION

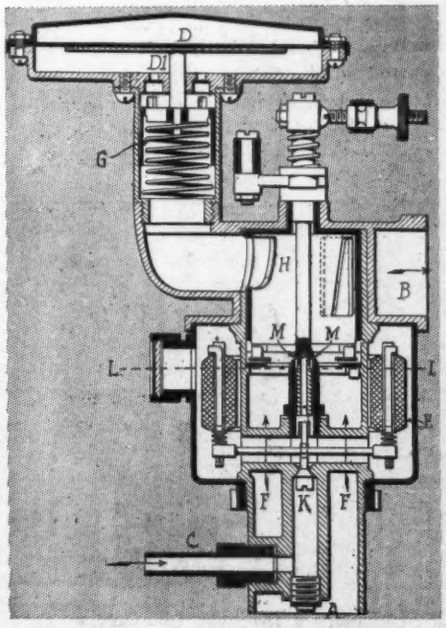
springs comprising semi-elliptic front members with a three-part platform system in the rear. The front springs are made 40 inches long, 2 inches wide, with eight leaves, and the rear system includes 48½-inch side springs 2¼ inches wide, with ten leaves, together with a 40¾-inch transverse spring with nine 2¼-inch leaves. The cross spring, as shown in the illustration, is at the rear of the end piece of the frame and attaches thereto by a projecting bracket. The use of bronze bushings in the spring eyeholes, the providing of oiling facilities and the tongueing, grooving and banding of the leaves show the carefulness of manufacture and the importance attached to this part of the running gear. Both axles, of chrome-nickel steel formed in I sections, are weldless forgings, the front axle fitted with jaw endings for taking the steering pivot hubs and the rear axle dropped 2¼ inches to give room for spring action. The former axle is made with 2½-inch depth, ¼-inch web and 1¾-inch upper and lower cross, formed from 5/16-inch stock. The steering yoke has a 6-inch gap. The vertical pin for holding the pivoted axle hub has a ¾-inch diameter and is provided with a row of balls at its upper end and a bronze cone at its lower end. The pivot axle has a maximum diameter of 1 5/16 inch, with a gradual outer taper, and carries an outer and an inner race of ball bearings, in each of which the balls are ⅝-inch diameter. The tie bar connecting the steering knuckles lies in the rear of the axle and couples with a Gemmer steering gear. The rear axle is somewhat heavier, having a 3-inch depth but 1½-inch upper and lower cross. Its spindle ends have a 2-inch inner diameter, where ¾-inch ball bearings are used, but on the outer end of this spindle the balls are ⅝-inch in diameter, the same as used for the front road wheels.

A general review of the motor brings to note such accepted practice as that of placing the intake valves in the bottom of integral chambers on the right side, the exhaust in similar chambers on the left side, and opening them by direct lifter rods actuated from camshafts carried within the crankcase. The valves are made with integral heads and stems, machine steel being the metal used for the intakes but nickel steel for the exhausts. The camshafts, machine steel pieces, are provided with chrome-nickel steel cams keyed in position and separated by sleeves. The crankcase is made in upper and lower halves, with the four bearings for the shaft carried in the upper half, leaving the lower for oiling facilities only. The crankshaft, a forty-point carbon steel piece cut from a solid billet, is made with end throws set together, with the middle throws together and the second and the fifth together. The front bearing is made with a 2¼-inch diameter, whereas its remaining three bearings have 2-inch diameter. The diameter of all the wrist pins is 1⅞ inches. On the rear end of the shaft is a large-diameter flange to which the flywheel is bolted, and on the front end is driven a hardened steel gear. The intake camshaft gear is hardened steel and is driven from the fiber and bronze gear on the exhaust camshaft, the latter in turn taking its drive from the steel gear on the crankshaft. In applying the copper waterjackets a simple scheme is used. The jacket for each cylinder pair resembles an inverted pail with openings in the top for the return water connections, valve cages and priming cups. The sides of these jackets reach well down on the cylinder wall and rest upon a beveled integral flange encircling the piston wall. Once fitted over this flange a steel hoop or ring is slipped over the jacket and pressed down and, by virtue of the bevel face on the cylinder flange, clamps the lower end of the jacket upon the flange, forming a water tight union. In order not to unnecessarily perforate these jackets the water is taken into the bottom of them through two nipples on the cylinder flange, but escapes from the top center by way of a brass nipple which is flanged and brazed to the waterjacket. The circulation depends upon a rotary pump with a sliding rectangular piston driven by a two-jaw clutch on the front end of the magneto shaft. The water supply is greatest on the exhaust of the motor, where the maximum heat is encountered. A belt-driven fan assists the radiator in its task.

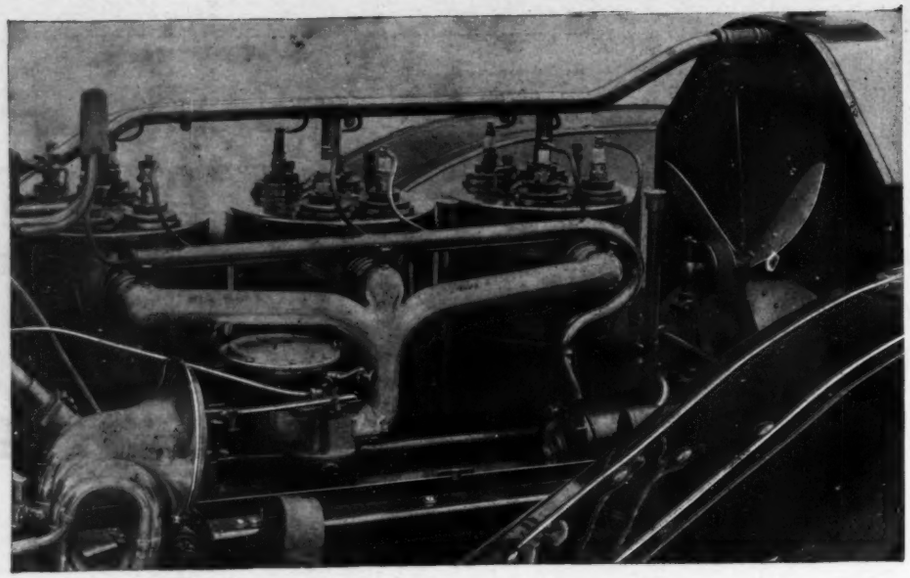
In lubricating the motor the leading work is done by a fourteen-feed Detroit oiler carried beneath the bonnet. Of the fourteen leads six connect direct with the cylinders, four with the crankshaft bearings, three with the crankshaft bearing oil



ACCESS TO JACKSHAFT SPROCKET



SECTION OF CHADWICK CARBURETER

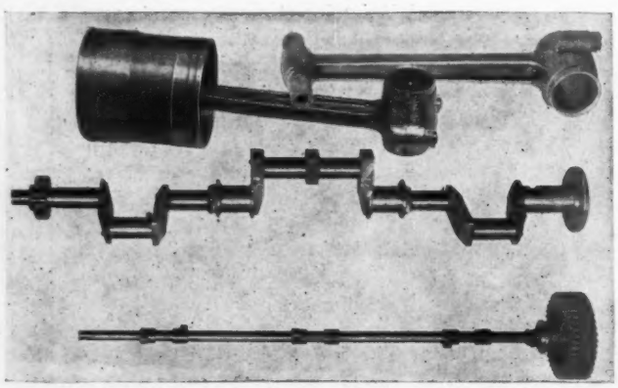


INTAKE SIDE OF CHADWICK SIX-CYLINDER MOTOR, SHOWING CARBURETER

wells and one passes to the transmission. In oiling the lower bearings of the connecting rods, the crankpin is bored. Attached to each throw of the crankshaft is a hollow copper plate or disk which receives the oil from the splash, which oil by centrifugal force is carried to the outer portion of the disk, where it is delivered through the crankpin to the connecting rod bearing. The two end bearings of the crankshaft are fitted with oil wells and ring oilers.

A Simms-Bosch magneto carried to the right of the front cylinder pair and gear-driven is the main source of current supply, but has assistance in emergency cases from a storage battery. These two current sources connect respectively with their own sparks plugs, the magneto set mounted in the caps over the intake valves and the battery set similarly located above the exhaust valves. The six high-tension wires from the magneto distributor are inclosed in a tube carried on the intake manifold close to the cylinder heads and the high-tension wires to the plugs over the exhaust valves are carried in a similar tubing supported on the return water pipe. For the battery system a unit coil is carried on the dash and a distributor on the top of the vertical shaft in front of the dash is driven from the motor crankshaft.

Furnishing mixture for the six cylinders brings the reader face to face with the Chadwick carbureter, which is a pet design of the maker and one claimed to give smooth and quiet running. With this carbureter, when the throttle valve is operated, allowing more or less fuel to pass to the motor, the escape of gasoline from the spraying nozzle is regulated also, the interconnection between these two functionaries being adjustable according to motor needs and conditions. The sectional view of this carbureter and the external illustration of it show its general makeup. The normal air intake A is at the base, the gasoline connection with a fuel tank is marked C, B indicates the attachment of the intake manifold to the cylinders, the diaphragm D suitably encased in a mushroom compartment at the top of the carbureter connects by a stem D1 with a sliding auxiliary air valve G—a chip from Kreb's workshop. The float E is a ring member entirely surrounding the spraying nozzle. The throttle is a vertical cylindrical member with ports in one side for establishing an open passage to the exit B. The spraying nozzle standpipe has a valve seat MM at its top end which acts in connection with the throttle H. Its hollow stem is provided with cross holes and threads into the standpipe, so the valve can be closed or opened by rotation of its stem, which rotation takes place at the time of throttle control. The rotation of the throttle also increases or diminishes the area of the annual air passage past the top of the standpipe valve by a plate arrangement similar to a kodak diaphragm, the effect of this opening or closing being to increase or diminish the air velocity past the nozzle and consequently vary the amount of gasoline licked up by the passing air. The linkage connecting the gasoline nozzle valve and the throttle is such that the throttle may open relatively faster or slower than the nozzle valve so every possible variation of mixture can be had. Air before entering the carbureter passes through a copper jacket surrounding the exhaust manifold. Gasoline to the carbureter finds accommodation in a 25-gallon tank located under the driver's seat and within which tank a 1-pound pressure through a reducing valve from the motor exhaust is maintained. On the car dash is a pressure indicator which has connection with the top of the gasoline tank. This pressure system is required only when ascending steep hills.

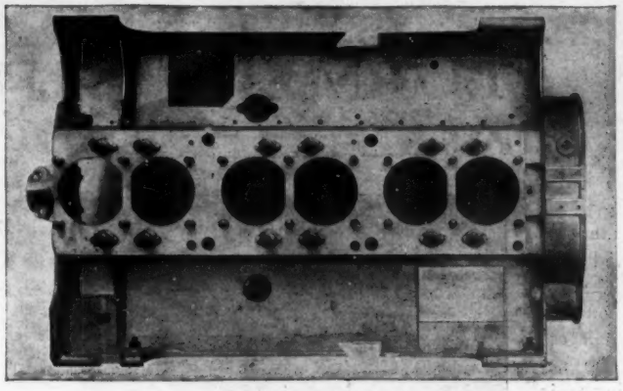


CHADWICK CRANKSHAFT, CAMSHAFT, PISTON AND CONNECTING ROD

Considerable attention is given by the maker of the Chadwick car to the four-speed transmission, which is described as a semi-selective set with one sliding unit, consiting of three gears carried on the mainshaft. As already noted the double bevel on the differential and the bevel on the rear end of the countershafts, as well as that on the mainshaft, are the attractive features of this gearset. Because of the extra bevels direct drive on the fourth speed is possible and on all other speeds there is but one transference of power, namely, from the mainshaft to the countershaft, thence by bevel to the differential as on direct drive. Both shafts in the case are carried on D. W. F. bearings located between the upper and lower halves of the case, the latter half having integral arms for support. As in all chain-driven cars the rear end of the gearbox encloses the differential, together with the inner ends of the jackshaft. The outer ends of the jackshaft are carried in manganese bronze brackets fitted with races of ⅝-inch ball bearings. On the jackshaft are twenty-four tooth sprockets—steel castings—from which Diamond chains connect with thirty-four tooth sprockets on the rear wheels. The reverse gear of the transmission set is carried on a separate shaft in the base of a case and is the only shaft in the case carried on bronze bearings. Between the clutch and gearbox is a Hartford universal joint, in which the forward end of the driving shaft is flattened on two sides and slips between a pair of rollers, carried on studs secured in the clutch cone hub, thereby giving a limited universal action. All parts of this joint such as rollers, studs for carrying the rollers and the flat end of the driving shaft, are hardened. For chain adjustment manganese bronze banjo-shaped strut rods are required, the rods forming a skeleton, as it were, on which the aluminum chain housings are carried. The rods are revolubly mounted on the rear axle and are slotted near the front end for adjustment of the countershaft by means of a screw in the front end of the strut rod, the strut rod

at this point being split and fitted with a pinching screw.

Lastly come the brakes, consisting of a pair of expanding emergency shoes, acting within drums 12 inches in diameter and 2 inches wide. These shoes are bronze, fitted with cork inserts and act upon cast steel drums. Expansion is by toggle arrangement with easy exterior adjustment. These brakes are lever applied. The ordinary brake may be seen on the right half of the jackshaft in the illustration of the transmission. It is a 10½-inch diameter wheel, 2½ inches wide and furnished with cork inserts. Clamping on this wheel is a one-piece band, also provided with cork inserts. The emergency brake lever interconnects with the clutch rocker, disengaging the clutch before applying the brakes. Centered about the steering wheel for the control of the car are clutch and regular brake pedals and footboard; two plunger pedals, one working the throttle without reference to the handwheel throttle lever position and the other opening the muffler cutout; two side levers, the outer one for speed variations moving back and forward in a single slot, and the inner lever for the emergency brake. In this connection it should be noted that the change speed lever latches in each position and that the top of the lever can be pushed outward to engage the reverse only when the lever occupies the extreme rear position in low speed engagement. The reason for calling the gearset semi-selective is that by it the driver gets low, second and reverse without passing through gears but goes through second to get third gear and through third to get fourth or high, at which time the lever is in its forward position in the quadrant.



TOP OF CHADWICK SIX-CYLINDER CRANKCASE

HITE'S QUICK-CHARGE BATTERY

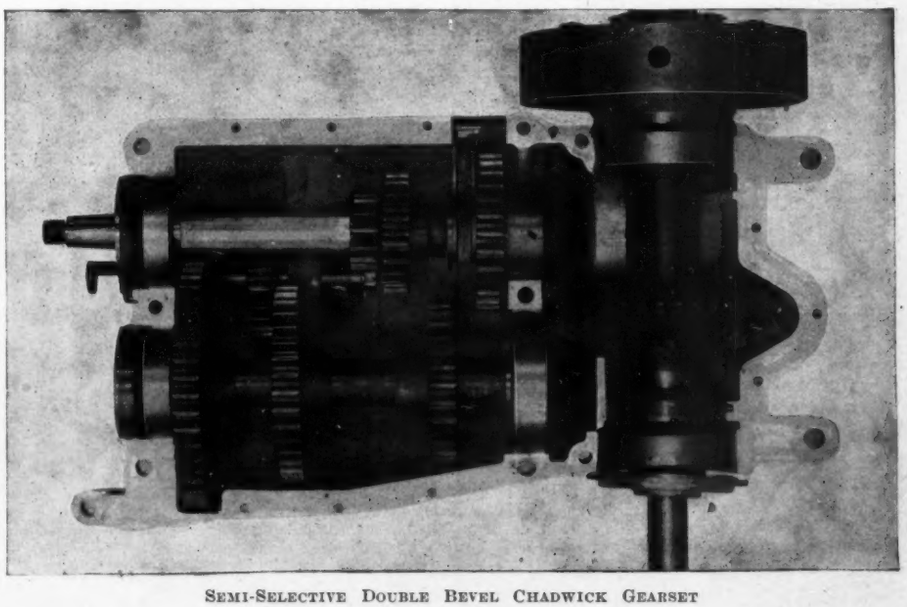
The Hite primary sparking battery for any style of internal combustion gas or gasoline motors of any number of cylinders, is manufactured by Charles E. Hite, 723 Walnut street, Philadelphia, Pa., and has claimed as its greatest feature a possibility of recharging it in from 3 to 5 minutes. This is done not by connecting it with an electric circuit and leaving it to fill in the regular order but rather by putting in it charged bricklets which may be carried in a small chest or in the tool box, and which bricklets the maker claims will give 1,000 miles of service. The current given out is from 6 to 8 volts, depending upon the coil used for high tensioning. When the battery is not in use a small lever on its end is turned to the "off" position, shutting off the current and making it possible to leave the battery idle for a long time without deterioration, so the maker states. By turning this handle to the "on" position the battery is immediately made ready for action. As it has but two terminals it is an easy matter to connect it. Temporary short circuiting is claimed not to materially affect the life or strength of the battery. The battery in its case occupies less space and is lighter than storage cells of anywhere near equal capacity, and the maker further asserts that by its use only one is required in a double system of ignition.

NOVEL CURRENT LOCK

The motor hood and circuit lock made by the Auto-Lock Plug Co., of New York city, is designed to afford to the motor car owner an effective means for preventing tampering with the motor of his car, as well as means for locking the circuit closer so that it is impossible for an unauthorized person to close the circuit and start the motor. The motor hood and circuit lock is adapted for application to any car in which the motor is mounted under the hood, such as four or six-cylinder motors. It consists essentially of a combined lock and circuit closer, which is mounted on the dashboard of the car, and a pair of locking bolts mounted on the dashboard under the hood and adapted for engagement with sockets provided inside the hood on the side plates. The lock is a specially designed Yale lock operated by key or combination as desired and is seated at an opening near the top of the dashboard, where it is readily accessible. The circuit closer is inclosed within the lock casing, which is on the dashboard under the hood. The lock mechanism is also connected by means of a pair of bell cranks with the locking bolts for the hood. These bolts are mounted in suitable guides on the dashboard under the hood and are adapted to engage sockets secured to the side plates of the hood. The locking bolts are adjustable in length to correspond to different sizes of hoods and are formed in sections, the sections engaging the sockets being mounted in sleeves in which they have a sliding movement and being protruded from the sleeves by means of springs. These springs permit the hood to be closed if the locking bolts are extended while the hood is open, the springs yielding as the beveled faces of the sockets slide over the ends of the locking bolts. If securing bolts for the side plates of the hood are not provided on the chassis, lugs or clips are provided on the inside of the side plates of the hood to engage the side beams of the chassis and prevent the side plates of the hood from being swung outward. These clips or lugs make it necessary to raise the side plates somewhat before they can be swung outward, and the locking bolts controlled by the lock on the dashboard prevent any upward movement of the plates as long as the bolts engage the sockets.

MOTOR CAR LITERATURE

The White Co. has just issued its Route Book No. 4, containing the detailed road directions of the air line route to the Jamestown exposition via Philadelphia, Wilmington, Dover and Cape Charles. Supplementing the road directions is an illustrated article full of useful hints to tourists contemplating a tour in that section.

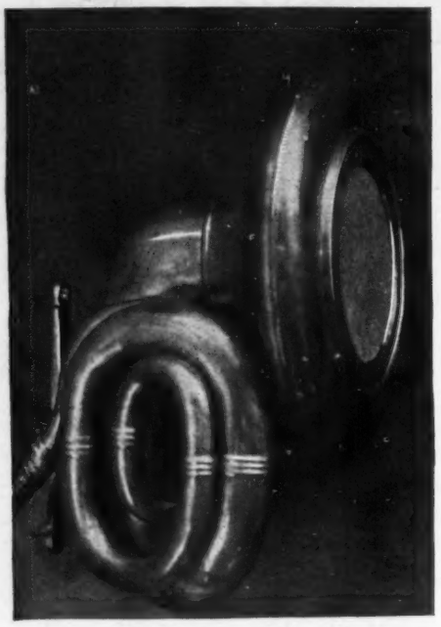


SEMI-SELECTIVE DOUBLE BEVEL CHADWICK GEARSET

DEVELOPMENT BRIEFS

HAS NEW DESIGN IN HORNS

The International Auto Horn Manufacturing Co., 151 East One Hundred and Sixth street, New York, under the direction of S. Solvini, has placed on the market the American horn, the latest model of which is shown in the accompanying illustration. This horn is of the double-curve type and connects with a 50-inch flexible air-tight tube with the sounding bulb. The flexible tubing used between the horn and the bulb, although the same in general appearance as used in connection with other horns, has a claimed superiority. It may be made of brass, copper, steel or other metal and in any lengths desired. It can be manufactured in lengths hundreds of feet long, perfectly air-tight and capable of standing a high pressure. Besides being used for horns this flexible tube is used for speedometers, odometers, oil pumps and many other uses on motor cars.



NEW DESIGN IN HORNS

HOW THE HILL OILER WORKS

Two illustrations on this page tell the story of how the Hill mechanical lubricator for motor cars operates. Both are interior drawings of the oiler as seen from the same point, but the pumping plunger occupies a different position in each. In figure A the up-stroke of the pump plunger is beginning and in figure B it is on the down-stroke. The centerpost B is revolved by means of a gearwheel I and a worm J, the latter driven by any desired means, as ratchet, pully sprocket or gear. In working the revolution of the centerpost B, carrying the plunger C, the plunger lever D, the compression spring E and the cam F, forces the end of the lever D down, at which time the opposite end is raised, raising at the same time the plunger C and filling the plunger cylinder with oil drawn out of the lubricator reservoir. An additional part revolution of the centerpost B and the lever D passes the end of the cam F, and instantly the compression spring pushes the end of the lever up and the opposite end down, carrying the plunger down with it and shooting the cylinderful of oil out to the bearing. By the time the plunger is ready to be forced down by the compression spring the opening Y of the centerpost B has revolved to register with the opening Z to the bearing, giving free passage thence for the cylinderful of oil. This operation is repeated for each feed of the oiler whether there be one to eight or one to sixteen feeds, as used on the type B or type BB oilers. Each feed is independently adjustable and the amount of oil delivered by any feed at each discharge may be diminished or increased by turning the proper adjusting rod up or down. This oiler has but one plunger for eight feeds and its operating mechanism is ground to an oil-tight seat in the particular tank in which it is to be placed. All Hill oilers are made with cast-iron tanks, but tanks of cast aluminum may be had by special order. The sight tests and sight feeds are made of polished brass casings in all models.

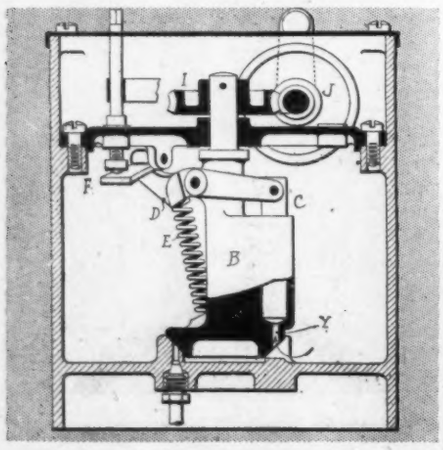
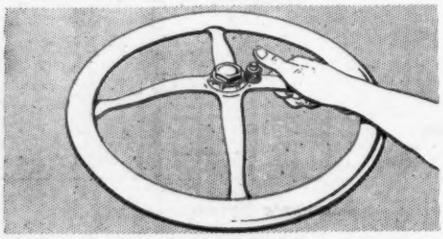


FIGURE A—HILL OILER IN SECTION

NEW ARTZ TONNEAU

The Dayton Folding Tonneau Co., of Dayton, O., has recently brought out a folding tonneau for the Rambler car 22 that fits to the car body in place of the regular deck box without altering the car body in any way. The extension front put on to fill out the length of the deck front has inclosed carrying space and would, with a cushion on it, be a convenient place to carry children. The latch on top to hold the box down when the tonneau is closed is a new feature and prevents all clatter on bumpy roads. The maker freely admits that when open it is not so sightly as a big side-door tonneau, but it is just as comfortable to sit in and it does not have to be open when not occupied. Folding tonneaus of the sort made by the Dayton company have proved popular because of their convertibility and consequent compactness. Even some large cars, such as roadsters, have been fitted with these seats, making them either two-passenger or four-passenger cars. It is predicted that another year will see many similar devices parts of the regular equipment of many large factories making roadster cars.



PETITE SAFETY SWITCH

PETITE SAFETY SWITCH

The American Motor Works, Grand Rapids, Mich., has placed on the market a compact and highly-polished brass safety switch which breaks the circuit instead of closing it when the button is pressed. The switch is actuated by a spiral spring, and is instantly automatic. It is designed to be attached to any spoke of the steering wheel spider so it will be "directly under the thumb," and its attachment calls for the use of but a single screw. The switch is insulated and weighs ½ ounce. It is intended to be operated by the thumb, and can be put wherever the owner desires, either on the steering wheel spokes or rim, or throttle lever. The depression of the switch by depriving all the cylinders of the spark converts the motor instantly into a powerful brake without even releasing the clutch. The actual size of the switch is slightly smaller than 1 inch in length of comparative height.

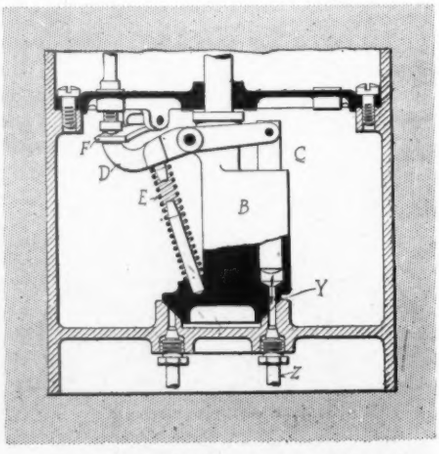
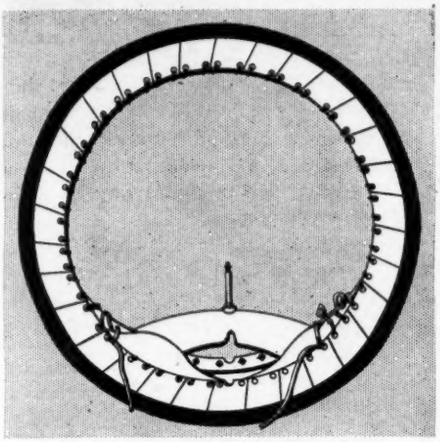


FIGURE B—HILL OILER ON UP STROKE

CURRENT MOTOR CAR PATENTS

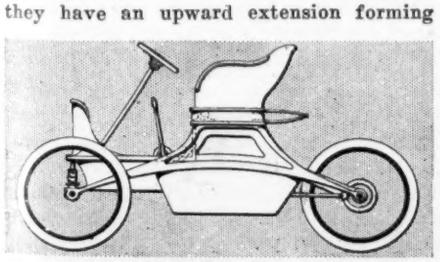


DUMAIS' TIRE PROTECTOR

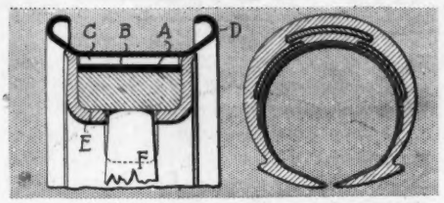
Inner Tube Protector—No. 857,876, dated June 25; to J. B. Dumais, Chicago, Ill.—The protector defined in this patent consists of winding spirally two strips of fabric one upon the other in opposite directions, a layer of rubber being interposed for holding them together. The tubular casing thus formed is slitted to allow placing the inner tube within it and is provided with hooks to close the slit by lacing, thus rigidly securing it.

Bevel Transmission Gear—No. 857,958, dated June 25; to A. L. Muren, Belleville, Ill.—On the rear end of the propellershaft are three bevel gears of different size, that nearest the front being largest and the other two of corresponding reduction in size. On the rear axle are two opposing bevel gears carried on the differential. These bevels are constantly in mesh, one having three tooth faces for meshing with the three bevels on the propeller shaft and the other with two tooth faces for meshing with the propeller shaft bevels diametrically opposite to the meshing point of the previously mentioned gear. Arrangements are provided for locking the pinions on the propeller shaft to the shaft as well as locking the large bevels on the differential.

Combined Frame and Body—No. 858,108, dated June 25; to E. Sanchis, Paris, France.—The frame of the motor car in question consists of two side members of pressed steel which extend from axle to axle of the car and midway of these axles arch upwards. At the center of the arch they have an upward extension forming



SANCHIS' FRAME AND BODY

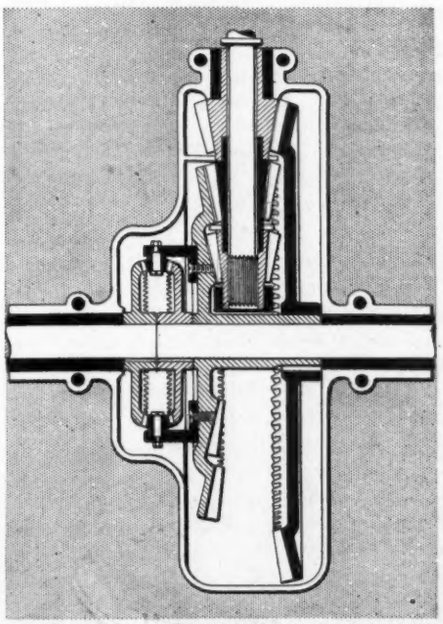


EWINS' TREAD PATAUD'S RIM

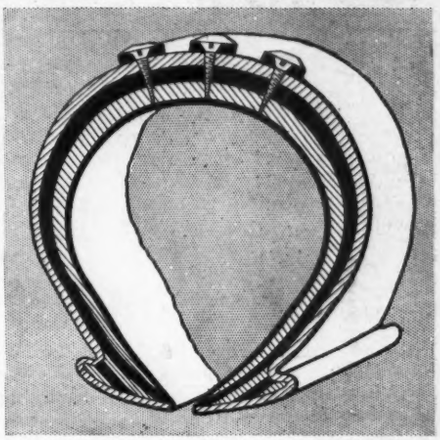
the side of the car body, and if desired this extension may be continued, forming the end of a seat. Provision is made for carrying a floor and seat on this frame and body work, a spring suspension being interposed. Still further integral parts of the frame side pieces are dropped pans forming a motor bed permitting of motor accessibility by openings at the front and rear, through either of which the motor may be removed or adjusted.

Metal Tread Tires—No. 857,796, dated June 25; to G. M. Ewins, Cedar Rapids, Ia.—Embedded in the tread portion of the inventor's tire casing are three continuous elastic metal bands, conforming approximately to the curvature of the tire and separately wrapped with canvas before being embedded in the casing. The middle or outer band is in the center of the tread and the remaining two overlap slightly with this and extend through the side part of the tire.

Removable Rim—No. 858,015, dated June 25; to H. Pataud, Paris, France.—The one-piece wheel rim D for taking the ordinary type of clincher tire rests upon a U-shaped elastic steel ring E which embraces the wood felloe A of the wheel and attaches to the spoke F. Resting on the felloe A is an iron hoop B and secured to this hoop are metal plates C which alternate with



MUREN'S TRANSMISSION

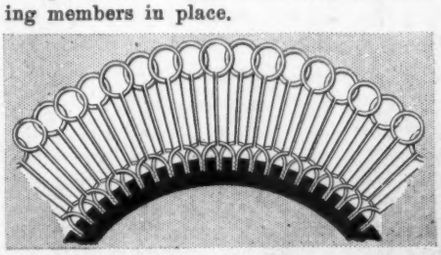


MESINGER'S REINFORCED TIRE

similar plates attached to the inner face of the rim D so that these plates interlocking prevent circumferential slipping. The rim D is adapted to be slipped sidewise over the ring E and when once over it and the tire inflated it is positively locked in position.

Reinforced Tire—No. 857,745, dated June 25; to F. Mesinger, New York, N. Y.—This tire is composed of three or more layers of rubber or fabric cemented together at the sides but separate from each other at the tread. Between the layers at the tread are inserted solid anti-friction materials, and to hold these in position three series of screws are required, which pass through the layers of the casing as well as through the anti-friction material. The heads of these screws are countersunk in the outer layer of the casing.

Air Cooling Device—No. 857,620, dated June 25; to E. B. Harshbarger, Bellefontaine, O.—For cooling the walls of a gasoline motor the inventor casts the cylinder with vertical grooves, into which he fits peculiarly-shaped tubular pieces formed out of a ribbon of metal. Each tubular piece is double tubular, having a tubular part radiating from the cylinder and a short transverse tubular part at the end of it. This double tubular radiating piece attaches to the cylinder by its inner end entering the cylinder grooves, there being a slight crimp in the part entering the groove, and as the ends of adjacent tubes enter the same groove the corresponding crimps in these assist in holding the cooling members in place.



HARSHBARGER'S COOLING DEVICE

FROM THE FOUR WINDS

Recruit For Independents—The Gearless Transmission Co., of Rochester, N. Y., was admitted to membership at the last meeting of the committee of management of the American Motor Car Manufacturers' Association.

Let the Horses In—The motorists of Hamburg, Pa., showed their open-mindedness and freedom from prejudice when, on July 4, they allowed many drivers of horses to line up their teams in the parade with which the motorists celebrated the national holiday. No cases of cars having been injured by the prancing steeds were recorded.

Farmers Aroused—It is reported in Indianapolis that the various horse thief detective associations throughout the country are preparing to unite in a war against speeding motorists. Just what action the farmers who compose the organizations intend to take is not known, but the Indiana members have long been hostile to motorists exceeding the speed limits prescribed by the law. It is understood that some definite step will be taken within a few days.

Chauffeurs Organize—A number of Philadelphia drivers have combined and organized under the title of the Philadelphia Mechanical Chauffeurs' Association with headquarters at 903 North Broad street. Only first-class men are eligible to membership, the by-laws providing for an examining board to determine the mechanical qualifications of candidates. The charter members of the P. M. C. A. hope to obtain official recognition of the local trade association. Meetings are held weekly on Thursday evenings. The officers of the new association are: John J. Woolson, president; Hans Holzheimer and James Endicott, vice-presidents; C. E. Stevenson, secretary; A. A. Deighton, treasurer.

Tip for Drivers—The recently completed 8-day trip of the Thomas Speedway Flyer around the Glidden tour route brought one experience to George M. Davis and E. C. Richard which might be copied by motorists with profit to the fraternity in general. The two disregarded the rules of passing to the right whenever they came to a road where there was a steep declivity or a bad ditch on one side. Frequently they met horses that showed symptoms of being scary and invariably when a plunge on the part of the animal would have thrown it and the wagon over the side of a cliff had it turned to the right the Thomas was sent to the dangerous part of the road. As the ground on the other side of the road generally rose as sharply on one side as it fell on the other the only alternative given the animal was to run up the side of a hill, a course which was never followed. This was a new idea to the drivers who were met and the two tourists say that the driver of the motor car should always motion to the driver of the wagon which way he shall turn.

Club Means Business—The Lancaster Automobile Club of Lancaster, Pa., has notified the officials of all the turnpikes in that county that unless the roads are put in proper condition within 30 days it will bring suit for maintaining nuisances.

Help Fresh Air Fund—The Indianapolis Sightseeing Co., which operates two large rubberneck cars, turned its vehicles over to the Indianapolis News' fresh air fund on Friday and Saturday of last week. While the cars made only their regular trips, half of the proceeds of the 50 cent fares was given to the fund to provide comfort for the sick babies at Cheeryvale, the fresh air camp maintained near Indianapolis by the newspaper.

Fast Work in Reo Bus—Tired, dusty and worn out, W. H. Seibert and F. W. Eisele of the Capital Auto Co. arrived in Indianapolis on the evening of July 3 with a Reo ten-passenger, 20-horsepower bus, incidentally establishing a record for such a vehicle. They left Lansing, Mich., on the evening of July 2 and drove 550 miles with only a few stops, in order that the bus could be placed in service for July 4. The trip was made at a rate of 21 miles an hour. The bus will be used for picnic parties and excursions.

Would Buy a Road—Wilkes-Barre motorists are endeavoring to secure control of the famous mountain boulevard near that city with a view of abolishing the stiff tolls now charged all motor car owners using it. The present owner of the boulevard, Albert Lewis, has announced his willingness to sell it to the motorists and to build another similar road for pedestrians and horse drivers. At present the motorists have no way out of the valley to the south except over the Giant's Despair hill, which is a trying climb even under the best of conditions.

Quick Thinking—E. C. Richard in a Thomas Speedway Flyer, crossed the bridge over the Susquehanna river at Columbia, Pa., and was arrested at the other end for going too fast although he had been careful to heed the warning sign. "I have only about a dollar and can't even borrow a penny until I get to Philadelphia," he told the deputy. "But go ahead and find some place for me to store the car and a hotel where I can stay and I'll send to the factory for some." "How long will it take?" the deputy asked. "A week at least," Richard assured him. This was something entirely unexpected. The deputy and the bridge tender went into immediate conclave. They found it would cost more to keep Richard and the car than the fine would amount to and a few minutes later he was on his way to Philadelphia, unmulcted.

Competition Mile in :34—Mail advices from Europe to the American Locomotive Automobile Co., New York, tell of fast time in the races of the Automobile Club of the Rhone, on June 15. The straightway kilometer race was won by a 40-horsepower Berliet car in the record time for competition of 34 seconds.

On Whitman's Trail—F. W. Work and C. J. Maxson, of Akron, O., traveling in a specially equipped 40-horsepower Oldsmobile roadster, spent a few days in Denver last week. They left New York city June 3, their objective point being San Francisco, taking the route blazed by Whitman just a year ago with a Franklin six when the new transcontinental record of 15 days 2 hours 12 minutes from San Francisco to New York city was made. The present party's route lies westward through Cheyenne, but the Oldsmobilists came off their course 100 miles to see Denver, a detour which they say well repaid them for their extra mileage.

Warns Motorists—"Warning! Slow down! You're in a police trap!" So read the signs which the Norristown Automobile Club of Norristown, Pa., has posted on all the roads leading into that town on which the coppers have measured off a quarter-mile stretch and placed watches. One of these signs is placed at each end of the trap. Many Philadelphians and tourists from distant states, lured into a trifle too fast pace by the splendid roads, have paid tribute to the Norristown treasury; but the local motorists are determined to put a stop to the nuisance if they can. They hope the signs will do it. If not, they are prepared to adopt more radical measures.

Quaker Club Growing—Thirty new members were admitted at the July meeting of the Automobile Club of Philadelphia, making a total membership of 436. Chairman Powell Evans, of the routes and sign post committee, reported that the work of posting the routes to Trenton and to Harrisburg was about to begin, to be followed later by similar work on all the highways leading into the city. The board of governors voted to double the committee's appropriation for the next twelvemonth, in order to avoid any interference with the committee's work that might result from a lack of funds. Secretary S. Boyer Davis, who is also club counsel, urged all members to sound their horns at every crossroad, the law calling for these often un-

necessary signals being enforced with ridiculous strictness in many sections of the state.

Must Stop Engines—In Erie, Pa., the authorities are preparing to prosecute motorists who leave their cars standing with the engines running, or with the gears in neutral position. They argue that in these days of easy-starting motors, the practice is entirely unnecessary and very dangerous and should be stopped.

Starts Suit in Buffalo—Assistant City Attorney William S. Rann of Buffalo has filed briefs in a suit of the city against Dai H. Lewis, secretary of the Automobile Club of Buffalo. The action was begun to recover a penalty imposed for failure to pay a tax of $5 on all motor cars by a new ordinance. Judge Hodson, of Buffalo, will probably hand down a decision in a few days.

Wants Drip Pans Used—Motorists of Buffalo are being pursued by Alderman Sullivan, who recently introduced before the board of aldermen a resolution requiring motor cars using gasoline to carry a pan or some other device to prevent the dripping of gasoline on the pavement. The fine for the first offense is fixed at $1 and for others $5. The resolution was referred to the committee on ordinances.

Olds Goes Abroad—R. E. Olds, president of the Reo Motor Car Co., Lansing, Mich., and chairman of the legislative committee of the American Motor Car Manufacturers' Association, has sailed with his family to Europe on the Hamburg-American liner, Graf Waldersee. Mr. Olds will remain on the continent 2 months, combining business and pleasure. He will study motor conditions there and arrange for Reo agencies on the other side.

New York Registrations—According to Secretary of New York State Whalen, who has just issued his semi-annual report at Albany, N. Y., the number of motor car licenses issued from his department in the past 6 months shows an increase over the corresponding months of last year of 1,711 for owners and 1,033 for chauffeurs. There were 6,288 licenses issued for owners of motor cars and 3,255 for chauffeurs. For these licenses $28,552 was received in fees.

Buffalo Club Growing—The membership of the Automobile Club of Buffalo is fast reaching the thousand mark. For several weeks the club has been waging a successful membership campaign and in 2 months has gained 270 members. In the campaign the arguments used were based on the efforts of the organization to put motoring in the class of safe and sane sports and to further the interests of sensible drivers of cars. In addition to this work in conjunction with the police efforts to prevent violation of the law the club has placed more than 100 guide boards on highways in western New York and has given valuable assistance to the cause of good roads.

Club of Many Homes—The City and Country Motor Club, of New York city, has added new suburban club rooms to its list of headquarters. The latest addition consists of a large suite with an assembly room at the Terre Marine inn, Staten Island, overlooking the Great South bay. Here there will be special accommodations and special reductions in price for members and guests of the City and Country Motor Club, at the conclusion of a very short run from the city over the good roads of Staten Island. The club now has three assembly places in addition to its city home, at 306 West One Hundred and Ninth street, New York.

Aerocar as a Climber—The Aerocar's latest stunt, it is announced, is the breaking of a noted climbing record over the 34 miles between Porterville and Deer Creek Hot Springs. The road between the two places is up a mountain that is so steep only two cars had ever made the trip before on their own power, it is said. The first car to make the climb did it in 2 hours 30 minutes. This record remained as the second car that went up did not beat the time. The third was the Aerocar which carried five persons all the way up in 2 hours 16 minutes. The low speed was not used on the entire trip—only the intermediate and high gear.

To Have American Brooklands—If the present plans of Millionaire Alfred Adams, Jr., do not go awry, Atlantic City will have a track on the lines of the famous Brooklands. He has secured a large tract of land just back of that famous resort and proposes to build a 5-mile banked-on-the-turns oval on which 2-miles-a-minute speed can be safely maintained indefinitely. The tract of land in question is 2 miles long and ½ mile wide. It is proposed to surface the track with a material which will allow of high speed even in wet weather. It is stated on excellent authority that Mr. Adams has succeeded in interesting several wealthy easterners in the scheme.

Long Tour Ended—Mr. and Mrs. Calvin S. Smith arrived in Chicago July 8 after having toured 4,500 miles in Europe and 1,500 miles in this country in a 50-horsepower Apperson without having once resorted to railway trains, their only other mode of transportation outside of the Apperson being the steamer that brought them across the Atlantic. The Smiths left Chicago February 15 and started on their tour from Genoa, Italy, traveling through Italy, Switzerland, Spain and France. They could speak only English, but this did not prevent them from enjoying themselves and making the natives understand them. They were stopped only once for speeding and one of their stunts was to take one of the southern passes over the Alps at an altitude of 10,000 feet above the sea. The Smiths figure it cost them $4,000 to make the tour. Mr. Smith declares high-grade American cars are the superior of foreign cars costing the same money and tells that the only mishap he had was a broken spring which was repaired by a blacksmith.

Good Coast Drive—Three hundred and fifty miles over good and bad country roads, south of Spokane, between Walla Walla, Wash., and Boise, Ida., in 16 hours 20 minutes, is the feat accomplished by W. B. Moore, son of former Governor Moore, a banker at Walla Walla. It is said to be the fastest long distance run ever made in the Pacific northwest in a 20-horsepower touring car. Mr. Moore was accompanied by H. P. Preston, manager of the Inland Empire Auto Co., and at Baker City they picked up Mrs. Preston and Miss Margaret Messick, of Salem, Ore., who accompanied them the rest of the trip. A Franklin car was used.

New Use For Car—Among the novel uses to which the motor car has been put is that of hauling fire apparatus to distant conflagrations. A recent instance of this occurred in Larchmont, a suburb of New York, when a fire broke out early in the morning in the car barns a mile and a half from the center of the town. The roads were so bad on account of heavy rains that the fire chief had both teams hooked onto the hose cart and sent for C. A. Singer, Jr., secretary of the Matheson Co. of New York, and a resident of Larchmont, to haul the fire engine with his car. The Matheson was equal to the task.

More Liberal Policy—Buffalo motorists have been informed that the boards of fire underwriters have adopted a more liberal policy in insuring motor cars in the city. A new form has been decided upon. Under the old form taking on gasoline inside a garage was prohibited but under the new form the tanks can be filled provided that a pump is used giving a direct connection. If this is done a charge of 50 cents for sanctioning the filling of machines will not be charged. The form says nothing about gasoline in a garage which implies that it does not prohibit its presence in small quantities. Cleaning machines by using a gasoline spray is prohibited.

After Toll Road Company—The supervisors of Onondaga county, N. Y., will start proceedings to compel the Syracuse and Fayetteville Toll Road Co. to improve its road or throw the toll gates open to the public. This road is on the main line across the state from Albany to Buffalo and is much traveled by motorists. Petitions will be filed with the highway commissioners of the towns of Dewitt and Manlius calling upon them to have the toll company place the road in a more satisfactory condition and to live up to the charter. The charter of the company requires the toll gates must be at least 3 miles apart, while the distance between the two gates of this road is 2⅞ miles.

The Commercial Car

SAMPLE OF THE ITALIAN TRACKLESS TROLLEY MOTOR CARS

THE MODERN European trolley motor car is giving strong competition to electric street railway cars and motor cars of the suburban and interurban electric lines and will undoubtedly enter their fields of operation more extensively in the future, together with the steam and gasoline motor car as well as the steam bus and gasoline, alcohol and oil motor bus. These motor cars are largely used in London and other English cities for passenger service and the trackless trolley is being utilized largely in Germany, France and Italy, while the steam-driven motor car and gasoline motor car are being employed by the steam railway companies in order to meet the competition of the high-powered electric trolley cars on suburban and interurban branches of the steam roads in several of the European countries.

The plan and elevation drawings of the trackless trolley show the construction and method of operation of a new Italian electric trolley motor car recently brought out at Milan by the Societa per la Trazione Elettrica. This trackless trolley system is simple and flexible and is said to be so reliable as to be taken into serious consideration as a suitable and convenient system of transportation for passengers and freight where the traffic is not sufficient to pay for a complete trolley system or where for some local reason the installation of the track is not possible. One of the main improvements of this Italian system, claimed over other European trackless trolleys, is said to be in the design of a proper type of motor car and in the current-collecting device. Flexibility and simplicity for the current collector are necessary, and it is maintained this Italian equipment allows the electric motor car a shifting of 8 feet 4 inches from both sides of the contact line. This is said to be sufficient for ordinary requirements of usual roads in country and city service.

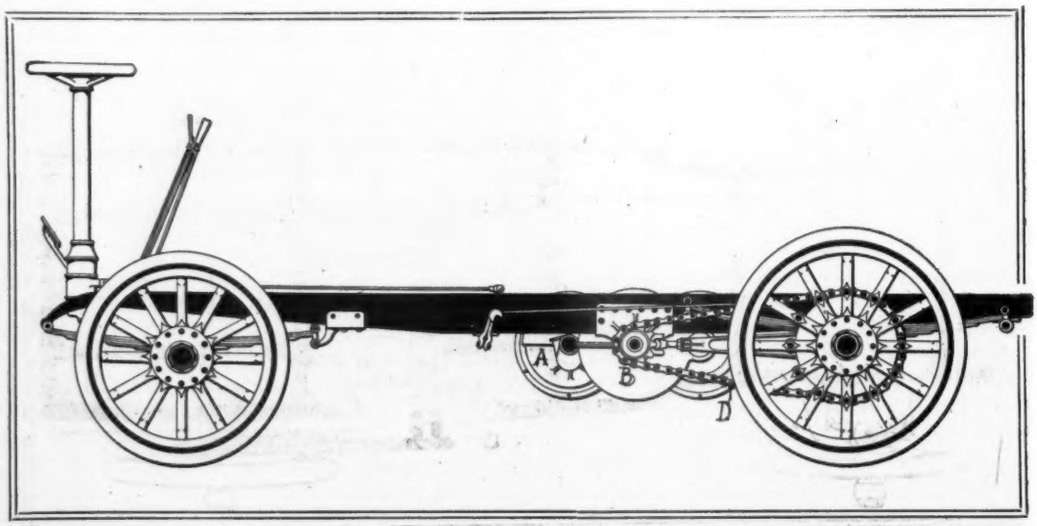
The current-collecting device consists of a rigid tube carrying at the top a special four-wheel trolley truck, the pipe being fastened on the motor car body in a similar manner to the ordinary trolley car pole. There is a ball and socket joint provided, allowing the collector readily to adapt itself to the irregularities of the trolley line, and it is maintained that even if the two wires are not spaced exactly accurately little difficulty will be found. In order to assure a good contact there is a pressure of from 11 to 13 pounds per wheel against the conductor wire.

This Italian trackless trolley motor car carries from fifteen to twenty passengers and has from nine to fourteen seats. The chassis is designed with a view of obtaining a very easy and smooth motion, the electric motors A and B being mounted with cylindrical gears operating an auxiliary axle or jackshaft C, the movements being transmitted from this to the rear axle by means of chains D D. In order to check the vibration the motor suspension is made by four upper supports. Each motor acts upon the gears through a special elastic coupling which transmits the movement smoothly, allows the motorshaft to make a small angle with the auxiliary axle or jackshaft and preserves the motor from vibrations due to gears and chains.

Two mechanical brakes E and F are provided on this Italian electric trolley motor car, one an internal expansion brake on the rear wheel and the other a ribbon brake on the jackshaft. By means of these brakes and the electric brake the car can run safely on very steep grades. A special type of hydraulic brake is also provided for these trolley vehicles for mountain roads, where the grades are unusually long and steep.

It is maintained that these trolley motor cars can run with perfect safety at a speed of 35 miles per hour with perfect comfort for the passengers and that they can be moved at that speed to the sides of the road without difficulty, sufficiently to allow the passage of other vehicles. The Italian engineers claim that the absence of the generator from the vehicle, in eliminating the water and gasoline reservoirs and other delicate devices, makes this type more simple and reliable than the gasoline or steam car, while the flexibility and simplicity of control of the electric motor in doing away with the differential gears and other mechanical devices insure other advantages.

There is no doubt that the trolley motor car service is greater in first



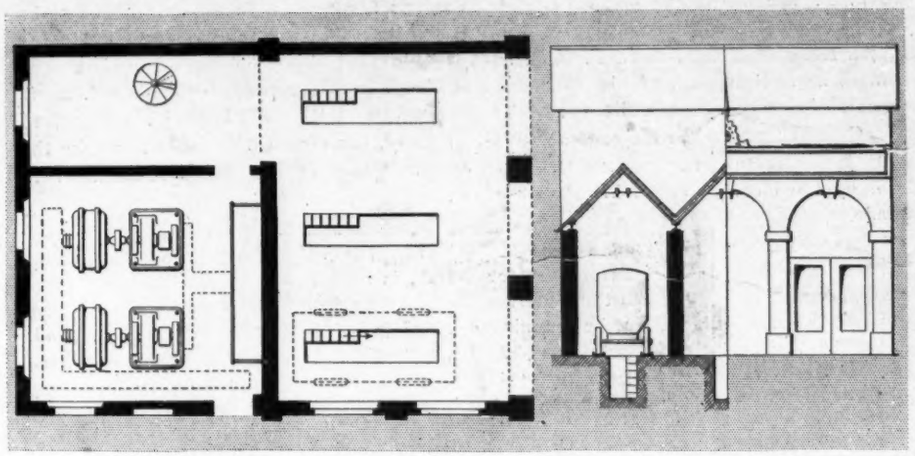
ELEVATION OF CHASSIS OF ITALIAN TRACKLESS TROLLEY MOTOR CAR

Trackless Trolley in Italy

cost than gasoline or steam power, but the economy in maintenance and energy utilized is to its advantage even where the traffic is not large. It is claimed that by comparison of several operating plants in Italy, where a public service requires more than three complete trips daily, the electric trolley motor car system is more economical than with gasoline or steam motor car service. It is held that this rule is not for general application, as the cost of electric energy and the cost of gasoline enter into the question vitally.

The gasoline motor cannot economically stand high overloads and the efficiency drops rapidly with the load, while series electric motors can develop high starting torque with good efficiency and have small weight and small dimensions per horsepower output. With a gasoline bus, it is held, the motor must be able to provide the proper acceleration to the vehicle and therefore the rate of capacity of the engine must be practically equal to the power required at starting, which is several times that necessary for normal speed. It will thus be seen that the gasoline engine must work at lower efficiency, as a large proportion of the time the load is considerably less than its greatest output. It is also claimed by the engineers favoring the electric trackless trolley motor car that, not only the weight but also the energy consumed is in its favor, a gasoline bus requiring greater space and having greater weight with its other auxiliary devices. The latter is said to be fully one-third heavier than the trolley motor car, with a consumption of energy from 30 to 40 per cent greater.

For a passenger trolley motor car the weight is said to be 4,400 pounds for a seating capacity of fourteen passengers and 5,100 pounds for twenty-four seats.

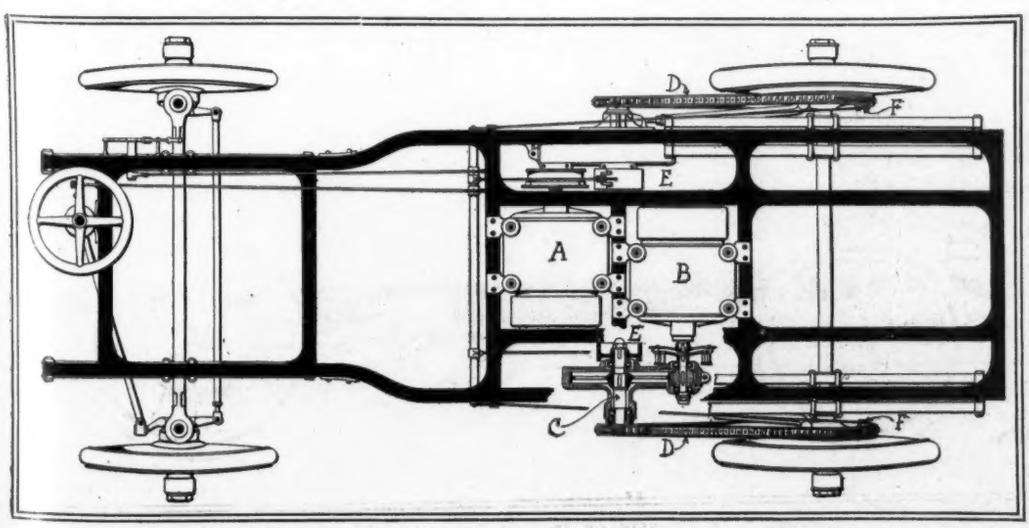


TRANSFORMER HOUSE FOR TRACKLESS TROLLEY MOTOR CAR SYSTEM

During tests made at Milan with a trolley motor car operating at a speed of 22 miles per hour and seating eighteen persons the consumption of power was found to be 560 watt-hours per car-mile with the roads in good condition, whereas with muddy roads the power consumption did not exceed 400 watt-hours per car-mile.

It is interesting to note that on the Spezia-Portovenere the energy consumption was 256 watt-hours per motor car mile. This trackless trolley line is 9⅜ miles long and has a maximum grade of 7 per cent. During a trip over this line the above energy consumption was noted after the car tested had hard service for a considerable period, having made 31,250 miles. On this 9⅜-mile line there are two electric trolley motor cars for passengers and one for freight, the current used is of the alternating system, and the cost of the plant was about $36,000, the 3-ton freight car costing $2,000 and the three trolley motor cars for passengers somewhat less than $9,000, one of these being held in reserve. The total cost of the line was $24,000 and the transforming station cost $2,000, about 15 horsepower being required at this station for each vehicle.

The operating expenses were divided into two classes, one being proportional to the number of car-miles and the other independent of the traffic, including the general expenses, interest on capital, maintenance and depreciation of stationary machines. The operating expenses, including the repairs and maintenance of motor cars and depreciation of the same, as well as the maintenance of this line, is said to be .16 franc, whereas the energy, counting 480 watts per car-mile at 15 centimes per kilowatt-hour, is .05 franc, making a total of .21 franc or about 6⅔ cents per car-mile. These Italian engineers hold that in normal cases the operating expenses per car-mile are between 48 and 64 centimes, or from 11 to 14 cents, the fixed charges increasing the cost per car-mile more or less according to the amount of traffic. For connecting manufacturing plants to railway lines this system of transportation may be of service and it may have a field of application in the rural districts of the United States where the population is so scarce that but few cars can be operated at considerable intervals and the very high fixed charges of the ordinary electric trolley system using tracks would make the installation of such a railway impossible as a paying proposition. The remarkably low cost of construction per mile when only the overhead trolley wire is required and there is no heavy fixed charge for track construction is noted by the above data of this Italian electric trackless trolley line.



PLAN VIEW CHASSIS OF TRACKLESS TROLLEY MOTOR CAR

AMONG THE MAKERS AND DEALERS

Morgan Resigns—R. L. Morgan announces he has severed his connection with the E. R. Thomas Motor Co., of Buffalo. He was connected with the designing staff.

Ezra Kirk Sells Out—Ezra E. Kirk announces he has disposed of his interest in the Kirk Brothers Automobile Co. of Toledo, O., and that he has resigned as president and director, the vacancies being filled by the election of H. W. Fraser of Toledo.

Rainier Factory Progressing—J. F. Rainier, president of the Rainier Motor Car Co., announces he expects the new factory at Saginaw, Mich., to be running August 1. The company is installing $25,000 worth of machinery, he says, and this will be followed by $25,000 more in machinery.

Big Stearns Deal—Frank B. Stearns, representing the F. B. Stearns Co., has closed a contract with Wyckoff, Church & Partridge of New York, for the sale of the Stearns car in New York city for the next 3 years. The minimum value of the cars to be taken by this concern is $3,000,000. This is claimed to be the largest contract ever entered into by an agent for the same cars.

Receiver for Craig-Toledo—An involuntary petition in bankruptcy has been filed against the Craig-Toledo Motor Car Co. by the Carpenter Steel Co., Harris Mfg. Co. and Charles E. Miller, the aggregate claims representing $3,486.26. E. J. Marshall was named as receiver by the referee in bankruptcy. It is said the liabilities will reach in the neighborhood of $50,000 and as soon as the receiver can make a statement the amount of the assets of the company will be known.

Duryea Trustee Appointed—Referee Bertolet gave the creditors of the bankrupt Duryea Power Co. a hearing and there was a battle of ballots over the selection of a trustee, the Berks County Trust Co. winning by one vote over the Pennsylvania Trust Co. The winner held proxies of creditors representing claims of $45,000 and the Pennsylvania company held proxies for $10,000 in claims. The defeated concern gave notice of an appeal but the Berks company will assume immediate control. Referee Bertolet admitted the claim of Charles Duryea for $10,000 and allowed him to vote his claims for the Berks company. He declined to allow H. M. Sternbergh to vote his $14,000 claims against the company for the Pennsylvania company on the grounds that he is indebted to the Duryea company to the extent of $26,000 for stock subscriptions.

Boyd Makes a Change—William J. Boyd, associated with the Philadelphia Crawford agency, has gone to New York to take the management of the Lea speedistmeter in the metropolis.

Kankakee a Bidder—The Worth Gearless Automobile Mfg. Co., of Evansville, Ind., is reported to be considering a proposition to locate at Kankakee, Ill., provided $100,000 of 10-year 8 per cent bonds are floated in Kankakee, to be considered in the nature of a loan for the construction and improvement of the plant.

Takes the Continental—Edward J. Kehoe, a broker and real estate dealer, has taken the management of the New York branch of the Continental Automobile Mfg. Co. Mr. Kehoe is a contestant in the Glidden tour as is C. S. Johnston, treasurer of the Continental Automobile Mfg. Co., and after the tour is over the New York branch will be opened.

On Glidden Route—The Twentieth Century Motor Car Co. expects to do a rushing business while the A. A. A. tourists are in South Bend, catching them coming and going. The garage is 65 by 160 feet and is constructed without a post, the roof being supported by a steel frame and having plenty of skylights. It is equipped with a modern machine shop and is only one block from the Oliver house.

Salon Show Space Prices—The application blank for the fourth annual show of the Importers' Automobile Salon, which will be held in Madison Square garden, New York, December 28-January 4, quotes the rental prices as follows: Main floor, $2.50 per square foot; elevated platform, $2; exhibition hall, Madison avenue front, $2; mezzanine platform, $2; balcony, $1.75; concert hall, $1.75; basement, $1.50. This includes all costs of decoration, floor and wall coverings, signs and current for lighting the signs, policing and the management of the show.

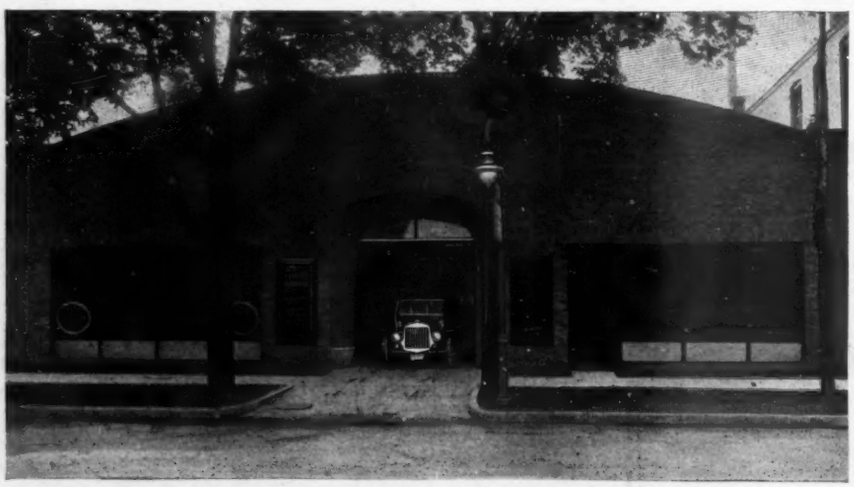
Perlman Takes On Aerocar—L. H. Perlman, 1871-73 Broadway, New York city, has taken on the Aerocar, C. A. Benjamin closing the deal. Mr. Perlman started in the first of the month.

Have Eames' Old Line—D. K. Moore, F. W. Gay and W. P. Kennedy of the American Distributing Co., 610 American Trust building, Cleveland, O., have sent out a card announcing that they now control the distribution of the goods formerly handled by Hayden Eames.

Big Dragon Deal—The Dragon people announce they have sold 1,500 Dragons to Perretti & Co., of Florence, Italy, and by the terms of the contract the Dragon company is to furnish 300 cars a year for 5 years, which are to be distributed throughout the territory of Europe, comprising Russia and Turkey in all their extent, and all European states contiguous to the Mediterranean and Red seas. Perretti & Co. also will do an export business from Florence to Asiatic and other countries.

Lear Going to Springfield—It is announced from Springfield, O., that the Oscar Lear company has decided to locate its factory in that city, a deal having been closed whereby the Frayer-Miller will be constructed in the factory building formerly occupied by the American Engineering Co. The Commercial Club is said to have secured subscriptions from Springfield citizens for $100,000 of the common stock at par. The building is 320 by 60 feet and the plant will occupy several acres of land.

Salisbury Outing—Tradesmen and others who were guests of the Salisbury Wheel and Mfg. Co., of Jamestown, N. Y., at the house party at Lakewood, N. Y., report a most delightful time. This annual affair attracted many motor tradesmen and their wives and families and for 10 days there was all kinds of entertainment, including tennis, baseball, golf, bowling, fishing, dancing and theater parties. There were two launches on the lake which were at the disposal of the guests and many trips were made. Mr. and Mrs. C. A. Picard, E. D. Shearman and S. H. Penfield represented the company.



TWENTIETH CENTURY GARAGE AT SOUTH BEND, IND., ON GLIDDEN TOUR ROUTE